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GVF Directory

& Satellite Resource Guide

2018

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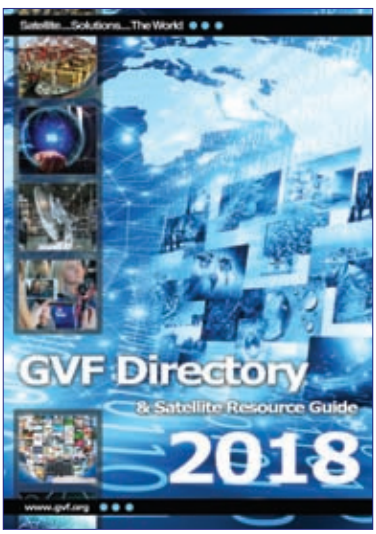

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David Hartshorn
Secretary General
Global VSAT Forum
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Major innovations driving the industry

When 'StarMan' was launched *en route* to outer space in early February this year global public attention was drawn by traditional and social media to a recent major innovation in satellite launch vehicle technology. Whilst the media focus was, inevitably, on the sending of a high-performance car into space, that focus also included fully deserved coverage of the almost simultaneous, ballet dance-like, controlled return to assigned landing pads of the Falcon 9 side-boosters which comprised part of the Falcon Heavy launcher, thus highlighting the significance of cutting-edge reusable launch vehicle design in making access to space easier and cheaper.

Other technological advances across the various segments of the satellite industry are less obvious to the worldwide media-watching public – new generation HTS platforms, cubesats, LEO constellations, low-cost commercial Earth observation – but all are making their respective vital contributions to rendering increased access to the social and economic benefits of an expanding range of innovative space-based applications, applications which embrace communications and the Internet, navigation, weather forecasting, natural resource management, environmental monitoring, climate modelling, and disaster mitigation early warning systems, and so the list goes on.

This accelerating *NewSpace* revolution brings an enhanced focus to expansion in the already established vital role of telecommunications in everyday lives across the world. Telecommunications applications continue to grow exponentially, and satellite-based solutions continue to be a vitally essential element in providing individuals with access to the global marketplace. Rapid development of new products and technologies, services and applications continues to advance, meeting ever-expanding requirements and demand, and allowing the industry to continually deliver valuable, secure, reliable, and cost-effective communication services, to enterprise verticals, to governments, to consumers.

Mobile users have become ever more reliant on evolving media habits and trends, such as smart devices, social media applications, the Internet of Things, Over-the-top streaming, Cloud and data storage services. Satellite bandwidth demand has increased with escalating user connectivity on mobile, on land, at sea and in-the-air channels.

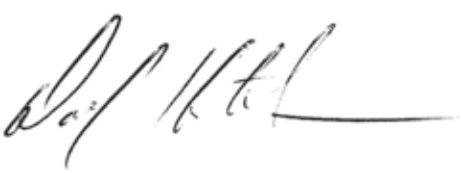
The communication systems and service providers highlighted in this 2018 Directory are all leaders and driving forces in rolling out satellite-based solutions transforming the way people, businesses, and organisations communicate worldwide.

Dramatic changes in the economies of satellite services, opening the door to a shift away from a one-size-fits-all solution to an approach that allows providers to offer greater data capacity at much lower costs, providing broadband for a vast range of applications tailored to stakeholders' fast-growing, diverse demands. HTS has added new dynamics in the satellite broadband communication ecosystem by expanding product and service applied innovations, increasing satellite backhaul delivery, and securing global network access that serve corporations, governments, militaries, non-governmental organisations, institutions, small and medium businesses, and individuals.

Included in this edition of the GVF *Directory Member & Satellite Resource Guide* are multiple initiatives designed to help take satcom services to the next level. The global communications community is using the GVF as a valuable tool kit, not only serving as a means of elevating their promotional profile, but as a provider of training for their staff and customers, a promoter of best practices and quality products, a leader in a 'culture of security', a critical supporter of global relief efforts and expanding access to key markets, and a guardian of continuous availability of bandwidth spectrum and sustainable space activities.

Anyone who wants to learn more about what the satellite industry has to offer is invited to make direct contact with GVF Members, either through the listings in this *2018 Directory,* or via the interactive online GVF Directory at www.gvf.org. As a complimentary service to the communications community, GVF also provides numerous resources to strengthen awareness of the benefits of satellite-based broadband solutions and facilitates end user contact with the global satellite communications industry. Many of these resources are referenced in the chapter sections included here.

In serving for more than 20-years as the unified voice and advocate of the international satellite industry, GVF – as the non-profit and non-partisan association originally founded by 27 companies from throughout the world – has expanded to a community of almost 200 commercial organisations located across every major region of the world. Whether your organisation is a satellite service or system provider, a regulator or ministry, or an end user, we would be honoured to facilitate your participation in, contribution to, and benefits derived from the dynamics of this growth industry of today, and of tomorrow.



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Chairman

Arunas Slekys, Vice President, Corporate Marketing, Hughes Network Systems. Arunas Slekys is responsible for managing all of Hughes marketing communications and advocacy initiatives worldwide.

He holds a B.App.Sc. degree in electrical engineering from the University of Toronto, a M.Sc. from the University of Illinois, and a PhD in computer and communications engineering from UCLA. He is the co-author of a founding patent for wireless data systems (CDPD), and is a frequently published author on satellite and wireless communications. Dr. Slekys has served as the elected Chairman of the GVF Board since 2006.

Dr. Arunas Slekys
Vice President Corporate Marketing
Hughes Network Systems, LLC

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Director

Yasir Hassan, Director of Transmission Operations, Arabsat. Yasir Hassan has almost 20 years of experience in the telecommunication field starting with King Fahad City for Satellite Communication in Saudi Arabia. He joined Arabsat in July 1998, held the position of Engineering Services Head in 2008 and was selected to be the Director of Transmission operation in 2010.

Mr. Hassan holds a Bachelor of Science with honour degree in Electrical & Electronic Engineering from Eastern Mediterranean University, Northern Cyprus, and obtained his MBA from University of Leicester, UK in 2005. He also serves as a Director on the Satellite Interference Reduction Group.

Yasir Hassan
Director of Transmission Operations
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Director

Nick Dowsett, Director, IntelsatOne Enterprise Solutions, Intelsat. Mr. Dowsett is responsible for developing and managing Intelsat's IntelsatONE Enterprise Solutions portfolio of managed solutions. Since the launch of the IntelsatOne portfolio in 2002, he has overseen its significant growth of enterprise customers and traffic.

Mr. Dowsett has been employed in the global telecommunications industry for over 30 years. Prior to joining Intelsat in 2002, he worked for six years at Concert Communications Inc., a British Telecommunications and AT&T joint venture company. Employed as a Senior Manager, his responsibilities included managing all commercial aspects of a global circuit-switched voice product and the development & launch of a global IP-based enterprise voice product offering.

Nick Dowsett
Director, IntelsatOne Enterprise Solutions
Intelsat

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Director

Paul Deedman, Director, Spectrum Regulation, Inmarsat. Mr. Deedman's role in Inmarsat is to ensure that the necessary international spectrum regulations are in place for the continuing operation of the current Inmarsat satellites, network, and future systems. He is involved in CEPT spectrum activities and the ITU-R working parties, most recently on issues such as new regulations for Ka-band mobile terminals (ESIMs) and protection of the L-band MSS spectrum for proposed terrestrial LTE systems. He has participated in all of the ITU World Radiocommunication Conferences since 1997, and has been closely engaged in the regional preparations for WRC.

Mr. Deedman joined Inmarsat in 2000, having previously worked for the Radiocommunications Agency, and has an honours degree in telecommunications from the University of London (Queen Mary College).

Paul Deedman
Director, Spectrum Regulation
Inmarsat

inmarsat

Director

Simon Gray, Senior Vice President of Humanitarian Affairs, Eutelsat. Mr. Gray is also a member of the ITU Advisory board for developing disaster comms strategy worldwide. He has been elected by the other eight satellite fleet operators to coordinate the satellite charter with the UN for the satellite industry. Mr. Gray has worked in the satellite industry for over 20 years and while at Eutelsat has been responsible for the largest training program ever undertaken by a satellite operator. His role in Eutelsat has also encompassed developing a new class of satellite terminal, equipment approval, mobile apps, training courses & training tools. His team has also been responsible for overseeing over 350,000 terminal installations across four continents and he is the point of reference for the Eutelsat fleet for remote terminal technology.

Simon Gray
Senior Vice President of Humanitarian Affairs
Eutelsat

Director

Keith Johnson, Senior Vice President, Speedcast. Mr. Johnson has 30 years of experience in the satellite telecommunication and energy industries. In his role at Speedcast, he oversees all of Speedcast's business activities for the energy and oil & gas sector, including strategic planning, programme management, business development and global sales. He is a member of the Executive Staff, and participates directly in supporting the various strategic acquisitions made over the last few years.

Mr. Johnson is an author of many published papers on telecommunications, satellite, wireless and IT. He attended Texas A&M University, and graduated from Houston Baptist University with a double major in Marketing and Management.

Keith Johnson
Senior Vice President
Speedcast

Director

Nancy Eskenazi, Vice President, Legal & Regulatory Affairs, SES. Mrs. Eskenazi has more than 20 years of experience in the satellite sector, Ms. Eskenazi brings a unique regulatory and policy perspective to GVF. In this role she leads development and execution of regulatory and policy strategy for the Americas, Europe, Russia and Turkey. She also manages global export control, sanctions compliance and antitrust matters. Nancy is closely involved in regulatory, policy and spectrum matters on national, international and at the ITU levels.

Ms. Eskenazi holds an LLM in International & Comparative Law from Georgetown University and a Juris Doctor and MS in Television, Radio & Film from Syracuse University. She received a Bachelor of Arts degree from the University of Massachusetts at Amherst.

Nancy Eskenazi
Vice President, Legal & Regulatory Affairs
SES

General Assembly & Members' Meetings

A General Assembly will be convened at least once each year in the 4th calendar quarter (Oct.-Dec.) and at other times as deemed necessary by the Board of Directors. The purpose of the General Assembly will be to present to the Membership: Election of the Board; Proposed Constitutional Amendments; Financial Reports; the Secretary General's Report; and other business as appropriate (strategy, policy, etc.). Non-Members of the GVF may be invited by the Secretary General to attend the open portion of these General Assemblies. The agenda and ballots for all formal votes will be delivered to the authorized voting representatives 30 days in advance of the General Assembly. Ballots may be returned in person at the meeting or by post. All votes made by post must be received at the designated location 7 days in advance of the meeting. A quorum will be deemed to be established for any General Assembly Meeting in which a minimum of 30 percent of the Full Members or 50 percent of the Full Founder Members are in attendance.

Members' Meetings will be convened periodically throughout each year, at times and in locations confirmed by the Board of Directors. The purpose of these meetings will be to provide to the Membership: Reports on global and local trends; Program Updates; Open Forum Discussions Related to Strategy, etc.; and other business as appropriate. Non- Members of the GVF may attend some portion of these Meetings.

David Hartshorn is Secretary General of the GVF, the London-based non-profit international association of the satellite industry. GVF consists of more than 230 member organisations from 100 nations in every major region of the world and from every sector of the industry, including mobile and fixed satellite operators, manufacturers, system integrators, and other service providers.

Supported by 15 affiliate offices, two regional offices and seven working groups, Mr. Hartshorn leads the Forum's global efforts to facilitate the provision of satellite-based communications solutions throughout all nations of the world.

Mr. Hartshorn works closely to support national, regional and global-level policy makers as they formulate state-of-the-art satellite regulatory frameworks. He is also responsible for creating greater awareness of the commercial, economic, political and technological advantages that satellite-based communications provide. GVF's education and training programme is an important means by which these aims are achieved.

David Hartshorn
Secretary General GVF

Martin Jarrold was appointed GVF Chief of International Programme Development in June 2001. His responsibilities include outreach to the 230+ member organisations of the GVF and the further development of the profile of the Forum within the satellite communications industry, and across the global telecommunications policy and regulatory community. This extends to the development and delivery of programmes focused on understanding and promoting the use of satellite-based communications in various key vertical markets.

He is a contributor to various telecommunications publications, and also frequently chairs and contributes to telecommunications conferences and symposia around the world. Martin Jarrold was formerly Commissioning Editor and Head of Research at Space Business International.

Martin Jarrold
GVF Chief of International Programme Development

Ms. Angie Mar joined the Secretariat as Director of International Programmes on November 2013. Her duties include managing the global promotion of current GVF members, events and initiatives, outreach to international organisations, and the creation of new opportunities and communication channels to benefit GVF Members. In addition to working for the forum and its members, she is responsible for providing support to the Satellite Spectrum Initiative, GVF working groups, and event programmes. Ms. Mar joins GVF with broad experience in the satellite industry and has developed a deep understanding of industry platforms to identify key market initiatives to grow platforms based on members needs. She previously tenured at the Intelsat Corporation, where she provided support to global and federal satellite industry regulatory initiatives, promoted international trade controls awareness, and contracts administration. Ms. Mar holds both an MBA and Master in Marketing degrees from the University of Maryland, and a Bachelor degree in Marketing from George Mason University.

Angie Mar
Director, International Programmes, GVF
GVF

GVF Code of Conduct Policy

Members must conduct themselves in their capacity and activities as a Member of the Global VSAT Forum in keeping with the aims and objectives of the association as outlined in the GVF mission statement, the GVF Opportunity and Rationalization document, and the GVF Constitution. Observing this code is a condition of membership in the association. If a Member is in breach of this code, or appears on reasonable grounds to be so, they may be reported to the Board by another member or a member of the Board.

The Board shall request, and the member concerned shall supply, all such information as is reasonable and relevant concerning the breach or apparent breach and may make such representations to the Board concerning the same as they may wish. The Board shall consider the evidence and the representations carefully and objectively, and shall record in writing their reasoning for any determination, and submit it to the Member concerned for comment, before the determination is actioned. Any determination by the Board must be proportionate to the breach or alleged breach and may consist of a verbal warning, a written warning, a suspension of membership or an expulsion from membership. In the case of an expulsion, no refund of membership fees shall be made. A determination made by the Board may be relaxed, suspended, withdrawn or reversed as the Board may further determine from time to time, on reasonable grounds.


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Cyber Security Task Force – A coordination centre for satellite security knowledge

During the past five years, the satellite industry's response to escalating cyber attacks has been transformational. Terminal manufacturers, satellite operators, and service providers – often in close coordination with end customers – have increasingly implemented comprehensive and well-coordinated measures to reinforce cyber security.

One of the earliest manifestations of this trend was the formation of the GVF Cyber Security Task Force. Launched in early 2014, the GVF Cyber Security Task Force is aimed at countering the increase in cyber security threats to the satellite industry. Chaired by Andy Tomaszewski, CIO/CISO/Vice President of Advanced Programs with iDirect, and Matthew Kenyon, Vice President, Network Security & Operations with Hughes, the Task Force identifies security best practices, and provides guidance on how users and industry can optimise the application of VSATs to reinforce network integrity.

With cyber-attacks on the rise across the world, and in a society that relies almost completely on digital networks, securing these assets is of paramount importance. David Hartshorn, Secretary General, Global VSAT Forum, commenting on the establishment of the consensus-based group noted, "The Task Force was launched in response to increasing occurrences of cyber-attacks and the perception that the industry must respond as robustly as possible."

The member companies of GVF, representing the major providers of satellite networking solutions, place security of communications utilising their equipment and services at the highest level of importance. As a reflection of that commitment, the Task Force's mission is to work with the broader communications community to maximise security in the entire end-to-end solution: from the network operations centre to the hardware and software security protection embedded in the VSAT terminal on the user premises.

The Task Force is leveraging its work with current measures being applied by the international satellite communications industry to defend against cyber-attacks. For the thousands of operators and millions of VSAT systems throughout the world, the satellite communications industry is evaluating how a variety of considerations – from training and support to security policies, standards and protocols – can be most effectively adopted.

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GVF and Satellite Industry Association collaborate on Joint Cyber Security Initiative

Recently, GVF and the US-based Satellite Industry Association (SIA) released a joint statement to all governments of the world regarding the satellite industry's commitment to cyber security, articulating core principles for cyber security and encouraging all segments of the satellite industry to continue efforts to address the dynamic challenge of cyber security. The statement emphasises the criticality of cyber security to the satellite industry's core goal of providing mission critical, highly reliable, and secure connectivity.

Drawing upon the industry's experience, GVF and SIA have identified three principles that – although not intended to be a comprehensive roadmap or exhaustive list – should be at the centre of private and government efforts to promote national and global cyber security:

- Voluntary, industry-led efforts and public-private partnerships are the optimal way to address cyber security at the national or international levels.
- Robust cyber security is aided by voluntary information sharing, free from fear of adverse consequences.
- Satellite industry organisations should actively address cyber security using industry best practices for risk management.

The joint statement and core principles are a product of the important lessons for effective cyber security learned by GVF and SIA members. The associations stress that security and risk management should be part of an organisation's overall corporate culture and organisations should implement and maintain best practices to protect against evolving threats, including by leveraging industry-driven resources to inform their own development of voluntary, proactive approaches to mitigate risks. Collaboration, not regulation, is the best way for organisations to manage cyber risks, the associations argue. Finally, voluntary information-sharing among the private sector, between the private sector and government, and between the private sector and end-users is vital.

Cyber Security Outreach

The GVF Secretariat, in close liaison with the Cyber Security Task Force, has, since the inception of the CSTF, undertaken outreach into the international cyber security dialogue and events environment to promote the work of the Task Force to the broad cyber security community, and to the various satellite solutions user verticals which have developed, or are developing, a cyber security conscious culture and associated protocols, particularly in the maritime vertical.

Recently, GVF supported, and contributed to the programme of, DSS ITSEC, the annual cyber security industry event, held in Riga, for the Baltic States, Eastern and Western Europe. A 2017 track, entitled 5G, Satellite & Cyber Awareness, on 19th October included the GVF CSTF presentation Satellite Cyber Security in a Unified Networking World.

This was in collaboration with the European Space Agency, and Antonio Franchi from the Future Projects Division of the Telecommunications and Integrated Applications Directorate, based at ESA-ECSAT in the UK. The Division accepted the GVF invitation – which arose out of the ESA Satellite for 5G Initiative to which GVF is a signatory – to provide a complementary presentation on *satellite-cyber security-5G* as the three vertices of a triangular inter-relationship reflecting the similar inter-relationship of *Extreme Mobile Broadband-Mission Critical Communications-Massive Number of Sensors* which characterises the future 5G networked world. The presentations can be viewed on YouTube at https://www.youtube.com/watch?v=xX0WzcjQTi0.

In the maritime vertical environment the CSTF has worked with the GVF Maritime SatCom Forum (MSF) in engaging with maritime events produced by commercial/third party exhibition and conference organisers. For example, the CSTF/MSF has contributed to various Digital Ship programmes specifically focused on cyber security, and in 2018 GVF will engage with various maritime industry cyber security programmes, including:

- Lloyds Maritime Academy Cyber Security Seminar, London, 18th to 19th April 2018 (KNect365);
- Maritime Cyber Resilience Forum @ Posidonia, Athens, 6th June 2018 (Digital Ship);
- Maritime Cyber Resilience Forum @ SMM, Hamburg, 5th September 2018 (Digital Ship); and
- Maritime Cyber Resilience Forum, London, 4th December 2018 (Digital Ship).

In addition, during last year, the CSTF had cyber security inputs into the programmes of the GVF-EMP portfolio of events, specifically: Connectivity 2017, Oilfield Connectivity 2017, Cellular Backhaul 2017, AeroConnect 2017, and the London HTS Roundtable 2017. The 2018 iterations of these events will continue to address cyber security issues.

The CyberSat '17: Security in Aerospace programme, held in Virginia, USA, in November, dedicated to assessing the ever-evolving threat of cyber-attacks in the satellite and aerospace landscape, featured a presentation from GVF Secretary General David Hartshorn, illustrating the work of the CSTF and the GVF-SIA collaboration on the Joint Cyber Security Initiative. CyberSat '18 will take place 14th to 16th November.

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Crisis Connectivity & Capacity Building:

The satcoms imperative for Humanitarian Assistance & Disaster Response

Floods in Peru during January and the Taiwan earthquake of 6th February were early-2018 tragedies adding to a long list of natural disasters that occurred throughout 2017. Colombian mudslides in April, monsoon flooding in Bangladesh during the summer, hurricane Harvey in the USA and flooding and landslides in Sierra Leone in August, followed hurricane Maria in the Dominican Republic, the Mexican earthquake and hurricane Irma affecting the USA and the Caribbean all in September – all ranked high the international media headlines.

The first responder and humanitarian community gets some share of the all too rare headline attention given to humanitarian agencies during these tragic circumstances. When we see the faces and hear the words of agency workers in the field we are then made readily aware of the critical role of satellite in bringing us the pictures and voices that report on human suffering and that appeal for help with emergency funding.

What, perhaps, is not so obvious is that the role of satellite communications in such circumstances is not limited nor confined to news reporting, and to broadcasting appeals for monetary aid, but is an integral and mission-critical foundation to the work of organising and delivering humanitarian aid and resources. Whether it is in the first 24-48 hour period of an emergency response – supporting supply logistics, providing urgent medical care and coordination of relief efforts – or whether it is over the longer term period of recovery and re-building, satellite communications are key to the success of assistance programmes in bringing communications to remote areas – which are so often the most badly affected by disasters – or bringing effective functional communications to replace communications technologies and platforms that have been rendered ineffective or even destroyed in the course of flooding, a hurricane or a quake.

First responder community

Often, the first responder community comprises military forces and in a companion chapter in this Directory you can learn about the role of the GVF and its member companies in providing satellite broadband communications capacity building to strengthen disaster preparedness capabilities amongst more than 15 national militaries. *Satcom Endeavour*, part of *Pacific Endeavour 2017* (PE-17) which took place over two weeks in August, was highly successful in facilitating collaboration between military first responders and leading providers of satellite communication systems and services in a joint programme sponsored by the US Pacific Command (PACOM).

PE-17 was just one specific example of how the GVF's capacity building and training resource portfolio is addressing the needs of the humanitarian assistance and disaster response community. SatProf, GVF's training portfolio development partner, is now developing a range of disaster preparedness training courses to augment its already highly developed catalogue of essential satcoms training certification. These training resources are recognised as the *de facto* standard for the humanitarian assistance and disaster response programmes of all the United Nations agencies that deliver recovery efforts into the field.

Geneva, 2015, saw the *World Humanitarian Summit Global Consultation* when the world's leading satellite operators – EMC, Eutelsat, Hispasat, Inmarsat, Intelsat, SES, Thuraya and Yahsat, under the umbrella of the EMEA Satellite Operators Association (ESOA) and the GVF – announced the signing of a *Crisis Connectivity Charter* with the global humanitarian community as represented by the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA) and the Emergency Telecommunications Cluster (ETC). ETC is a global network of organisations that is led by the UN World Food Programme (WFP), and which work together to provide shared communications services in humanitarian emergencies.

The Charter, a key part of the GVF's humanitarian assistance and disaster response programmes, is planned for full implementation in 2018. It embodies a commitment from the satellite community to enhance connectivity in humanitarian emergencies and formalises terms and protocols in an effort to accelerate the ability of emergency response teams to access satellite-based communications when local networks are affected, destroyed or overloaded after a disaster. The principles of the Charter also include increased coordination to prioritise access to bandwidth for humanitarian purposes during disaster operations, pre-positioned satellite equipment and transmission capacity in 20 high-risk countries across the world, as identified by the ETC and other organisations, as well as providing training and capacity building services for the humanitarian community across all five populated continents.

Simon Gray, Senior Vice President for Humanitarian Affairs at Eutelsat – and a member of the GVF Board of Directors – represents the satellite sector on the management body of the ETC, and indeed, GVF is the only private sector entity with direct representation to the ETC. Against this background, GVF was a key participant during February 2018 at *Action on Disaster Relief III*, a GRV Global event in Panama City which included an invitation only meeting of the ETC, hosted by WFP with participation from ETC partners including NetHope, Oxfam, UNDP, WVI, UNICEF, and GVF. The meeting examined recent Caribbean relief efforts involving the ETC, emergency telecoms solutions used in the field, and working together to strengthen preparedness. Further details on the outcomes from the Panama City event will be published for the GVF membership in the monthly GVF eBulletin.

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MRA Working Group

The activities of the Mutual Recognition Arrangement (MRA) Working Group are designed to promote Quality of Service (QoS) by encouraging the deployment and usage of Type Approved (Quality Products) in the satcom market. The following describes the objectives and accomplishments of the GVF-MRA Working Group during the past year.

Accomplishments during 2017

The activities of the GVF-MRA were focused on two areas in 2017. These were: (i) concluding the European Space Agency (ESA) funded study for the COMS or Earth Stations in Motion (ESIM) market and (ii) advancing the objectives of the SOMAP (Satellite Operators Minimum Antenna Performance Requirements) project. Brief summaries of these projects are outlined below.

1. ESA Study Contract

Work on the ESA contract was successfully completed at the beginning of 2017 following the submission of the final reports and presentations in January 2017 as required by the Statement of Work. The contract began - two years earlier via a collaborative effort between the Fraunhofer Institute and the GVF. The project had focused the mobile VSAT market for land and maritime different environments with clearly defined objectives. These included:

- Analyzing the current satellite mobile market segment.
- Identifying inefficiencies in the business transactions (buying/selling) of products and services related to SOTM terminals including ambiguities/inconsistencies in how products and services are specified.
- Identifying the needs of the members of the value chain in terms of how SOTM terminals should be specified and how those specifications could be trusted.
- Recommending solutions and standards for specifying SOTM products.
- Analyzing the verification needs to implement such standards.

The ESA study was modified to develop standard test procedures for qualifying ESIM terminals. This was accomplished by the distribution and industry acceptance of GVF-105. Type approval test procedures were validated following the modified GVF-105 document and using the motion profiles criteria developed by Fraunhofer as a part of this effort. The GVF and the Fraunhofer Institute are exploring opportunities to expand the study to include high speed rail and airborne environments.

2. The SOMAP project

This represents a high priority project for the GVF. The project had its origins in 2013 following frequent discussions between members of the MRA. The GVF-MRA requested that the satellite operators evaluate the possibility of defining Minimum Antenna Performance Requirements for earth stations following the growth in demand for satellite services and the expanding market for COTM products. During this time the market experienced an increase in interference to services provided by the operators. It was concluded that the use of smaller orbital satellite spacing and the growth in the deployment of COTM terminals was a major concern. To address these concerns it was recommended that the leading satellite operators (consisting of AsiaSat, Eutelsat, Inmarsat, Intelsat and SES); work with antenna/VSAT terminal manufacturing community to improve the antenna terminal qualification process. A key part of this effort required that the satellite operators collaborate to develop an antenna qualification framework for its members who stressed consistency across the industry, for customers and antenna manufacturers. The resulting framework was adopted by the SOMAP working group was first released to the public during the 2017 CommunicAsia Conference held in Singapore.

The Satellite Operator Subgroup minimum acceptance performance recommendations were driven by the following objectives:

- Achievement of clear and reliable under standing of product specifications and capabilities under anticipated operational conditions.
- Confidence that the antennas meet the specified performance through an agreed minimum testing regimen.
- Requirement to have all participating satellite operators seek the same information from vendors.

In order to accomplish the objectives listed above, the group developed minimum antenna performance matrices for C-band, Ku-band and Ka-band antennas. This information has been released and is now available on the GVF website at the following URL under the SOMAP tab https://gvf.org/approvals/gvf-mra-documentation.html. The GVF Satellite operator sub-group lists in detail additional information which is required on a mandatory basis solely for COTM products.

Antenna manufacturers are requested to publish their performance data using a standardized format on future data sheets. This is to facilitate link-budget analyses and to assist satellite operators in the antenna approval process.

The Minimum Antenna Performance Requirements will only apply to new antenna models which are introduced to the market after September 1st, 2018. They do not represent a new standard. Existing standards as ITU, FCC, ETSI remain in place.

The GVF will focus its near term priorities in 2018 in the following areas:

- Promoting the new recommendations through the many opportunities to engage with industry during 2018 through outreach programs, meetings and other capabilities at venues all over the world.
- Establishing a timeline listing the recommendations and requirements that terminal manufacturers should prepare for in order to meet the September 1, 2018 deadline.
- Identifying points of contact at each of the satellite operators for manufacturers seeking additional information.
- Directing the manufacturing community to the GVF website where all of the relevant SOMAP documentation may be found.

The GVF-MRA welcomes feedback on its objectives and continued support of the satellite communications industry and quality product initiatives. Please direct comments to:

David Hartshorn
david.hartshorn@gvf.org
Colin Robinson
colin.robinson@gvf.org

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GVF Team & Participants after successful HOST

GVF supports Pacific Endeavor

Militaries from throughout the Indo Asia-Pacific region have strengthened their disaster preparedness capabilities through expanded collaboration with the GVF and its member companies, which supported delivery of capacity building to enable more effective use of satellite-based broadband solutions. For two weeks during August, officers from more than 15 militaries collaborated with leading providers of satellite communication systems and services during Satcom Endeavor, a joint program of militaries from throughout the Indo Asia-Pacific sponsored by the US Pacific Command (PACOM) through the support and coordination of PACOM's MCIP Management team.

In August 2017, the Global VSAT Forum (GVF) was tasked by PACOM's Multinational Communications Interoperability Program (MCIP) Secretariat to coordinate and conduct Information Sharing Modules for Satcom Endeavor during the Pacific Endeavor 2017 in San Jose, California. The 2017 programme was designed to have participants receive GVF Certifications and exposure to emerging technologies and solutions, along with hands-on experience.

An advanced programme

In contrast to earlier Pacific Endeavor programmes, when a maximum of two or three certification modules were completed by each participant during the two weeks of Pacific Endeavor, each registered participant gained access to a bouquet of multiple online modules by way of a one-year subscription. This allows access to more than 24 GVF Online course modules on various satcom services and re-certifications. Starting with GVF Basic certification, the participants can progress further towards Advanced, Specialist, Mobile and Marine Satcom Certifications respectively. Each of the registered participants is able to choose any module they wish to study.

At the same time, the GVF team ensured each Satcom Endeavor participant in San Jose achieved a minimum GVF Basis certification.

This is a combination of online modules mentored onsite by Mahdi Bagh Computers' (MBC) resources during the Satcom Endeavor and Hands On Skills Test (HOST), using the VSAT equipment for practical applications.

To gain real exposure to emerging technology and solutions, and best practices in emergency communication for high availability disaster recovery (HADR), the GVF and some of its members coordinated to bring experts to deliver an overview of their solutions and to demonstrate and provide an opportunity to each of the participants to gain hands-on experience on actual equipment.

Day by day

14 August

15 participants from different nations presented country briefs which gave an overview of the existing satellite communication infrastructure and cultural aspect. Riaz Lamak of Mahdi Bagh Computers and a GVF Lead, PoC for Pacific Endeavor, provided an overview of the GVF, the following two-week programme, and subsequent to Pacific Endeavor, access the bouquet of GVF online courses for one year. The participants from Bangladesh, Cambodia, Fiji, Indonesia, Malaysia, Mongolia, Nepal, Papua New Guinea, Philippines, Tonga, Unites States of America and Vietnam were registered for the GVF Satcom certifications modules and online access to GVF courses were activated.

15 August

The GVF's certified examiners and Mahdi Bagh Computers' instructors {a group of experts comprising of Simon Gray (Eutelsat), Fehmida Lamak (MBC), Rory Eddings (AQYR) and Riaz Lamak (MBC)} gave guidance and support in mentoring GVF online courses. SatProf's Ralph Brooker, who provides content creation and administers online modules, gave an overview on the way forward on the GVF subscription, and how to access the Knowledge Centre.

In parallel, a dedicated satcom panel was invited to present emerging satcom solutions to the Pacific Endeavor Corporate Board, coordinated by the GVF. Simon Gray, Sr Vice President of HADR at Eutelsat and Director of the GVF, presented on the Quantum Program from Eutelsat which offers steerable, switchable, splittable and shapeable satellite beams and footprints. Scott Haywood, Director of Applied Instruments, highlighted the unique capabilities and ruggedness of the Satellite Signal ID meter X-3, which is necessary to accurately and quickly point a ground terminal to establish an interference-free robust link. Rory Eddings, Director Solutions at AQYR, highlighted Man-Pack antennas and their versatile applications during HADR operations. Tim Shroyer, CTO at GD Satcom, showcased the company's vast capabilities, from its global leading position in antennas, to the path-breaking man-pack satcom terminal for backhauling a portable LTE system. These solutions were demonstrated during Satcom Endeavor.

16 August

On the third day, the mentoring of GVF online modules continued. Scott Haywood, Director at Applied Instruments, gave detailed insight on usage and capabilities of the X-3 Satellite Signal ID meter. He highlighted its intuitive

GVF HOST

Eutelsat Sr VP & GVF Director Simon Gray's sessions

user-friendliness and robust design to withstand tough field challenges during HADR operations, and the procedure to programme and swap modules, etc., was explained. Thereafter, all the participants were given a demonstration of the meter and gained hands-on experience in application with a VSAT terminal to track satellite signals, point properly, beam balance and optimise the link.

17 August

Simon Gray provided a day-long session, presenting the step-by-step procedure to set up and install a remote VSAT ground system. Dos and don'ts, from electrical grounding to safety and weather-proofing, were addressed to ensure a robust interference free link is established, in line with the GVF satcom training and GVF Hands On Skill Test (HOST). Time-tested procedures for manual installation using a spectrum analyser, IDU and satellite ID meter to modern simplified mobile app and audio signals beeper-based installation procedures, were explained in detail. Thereafter, participants were appraised of the unique Quantum Program from Eutelsat.

In the second half of the day, a set-by-step procedure to install a VSAT using a spectrum analyser to mobile app was demonstrated. Small groups of three participants were asked to complete the installations, lock satellite receive signal and optimize. More than four different satellites were tracked by each group. Simultaneously, the GVF examiners team of Simon Gray & Fehmida Lamak evaluated the participants on the mandated score points for the GVF HOST.

18 August

Simon Gray, as the satellite industry's' coordinator for the UN ETC, shared details on the UN Crisis Connectivity Charter for humanitarian aid and disaster relief. How it will be activated in case of a disaster, standard operating procedures, satellite systems and donated bandwidth, capacity-building with UN FITTEST, etc., were discussed. This was followed by videos showing the correct procedure to make cable connectors, followed by hands-on practicals on accurately pointing a VSAT terminal using an audio beeper, making cable-connectors, and dressing up cables post installation.

Rory Eddings, Director at AQYR, presented on various manual and auto-pointing antennas experience from field deployments, and how to choose the right type of system based on the key applications. Furthermore, Rory shared the advantages and benefits of man-pack auto-deploy systems from AQYR and its key features. This was followed by a demonstration of the hands-on AQYR Typhoon system. All participants performed the same exercise in groups of three, getting a feel for the ease and speed of deployment and storage.

21 August

On the sixth day, Fahad Kahoor, Director of Govt Services at Thuraya, gave a detailed presentation on MSS, including the range of hardware available and their features; satellite phones, data streaming terminals, clap on sleeves, marine and vehicle mount systems with antennas and accessories were all available for participant handling. Case studies from past deployments showcasing how to choose and select the right equipment based on the HADR application was taught.

Safee Idrees, Director Asia-Pac and Tim Shroyer CTO, along with a team of three senior experts from General Dynamic Satcom, gave a high-level overview and system-specific capabilities of some of the flyaway satcom terminals, along with a portable LTE solution, as a key example of an interconnect-interoperable solution for quick deployment and expanded reach in a disaster relief situation. After a quick classroom session, a practical hands-on was done for the rest of the day by all the participants, which included setting up of the fly away satcom terminal as VSAT backhaul, along with portable LTE mast and eNote radios, its antennas acquiring signals, and interconnection.

22 August

Alvaro Sanchez, Director at Integrasys, shared innovative solutions for deploying VSAT systems in the field with mobile apps coordinated with most of the solutions installed at the main hub Earth station. This enables first responders to reach affected areas without carrying delicate and expensive test and measurement equipment for deployments and/or troubleshooting. This solution was then demonstrated live on VSAT systems, and the same exercise was then carried out by the participants.

The afternoon session started with a hands-on session conducted by Speedcast. Michael Kovacik, Network Planning Engineer, demonstrated the ease and speed of deployments of a manual fly-away with an iDirect IDU, and an auto-pointing sub one-meter system with an ND SatCom IDU. The participants were grouped into two teams for hands-on experience.

23 August

A classroom session was delivered on a Speedcast solution; terminals were installed

GD Satcom HandsOn for Flyaway & Portable LTE

Manpacks solution from Speedcast

Thuraya Solution by Fahad Al-Kahoor

and de-installed by Mike Crew, Director Govt Solutions, and Micheal Kovachik. After the brief session, the participants were again asked to set up both terminals, align them to the satellite, and live satellite bandwidth was provided to run applications. Multiple Skype calls were made via these two links. Thereafter, both systems were relocated on the terrace to let the participants practice skills on quick deployment and optimisation. De-installation and repacking into compact pelican cases was taught, hands-on. After lunch, Hung Tran Manager at SES Network and his colleagues gave an overview of its unique two antenna solution, followed by a demonstration of the same system outdoors with two pre-installed live AvL flyaway terminals.

24 August

Presentations were made by multiple industry OEMs and solution providers. ND SatCom's presentation focussed on case studies of actual deployments of their solutions for disaster relief. High level overview, expertise, standard operating procedures, best practices and satcom asset management protocols were explained by Major Torres, who is responsible for Satcom systems at US PACOM, Hawaii. Thereafter, Inmarsat and Iridium presented solutions with their own unique advantages, followed by Marlink.

After Action Review

After completion of the presentations, Satcom Endeavor Chairman MSgt Christopher Southerlin (USA) and Co-Chairman LtCdr Abdullah AL Mamun (Bangladesh), along with the GVF's Riaz Lamak, conducted the After Action Review (AAR) for the Information Sharing Module. The feedback and suggestions are detailed below:

1. It will be beneficial for all industry partners to share their real-world experience(s) in how their equipment worked in the HA/DR scenario.
2. Interpersonal relationships made were stressed as beneficial, and new technology trends were learnt.
3. Staying actively engaged in APAN throughout the year was emphasised; especially true as members transfer.
4. For several countries, cost is concern for industry products.
5. Encourage host nations to setup their satellite equipment and establish a connection using APAN outside of Pacific Endeavor for the sake of 'demonstration of performance'.
6. Allow confirmed SATCOM Endeavor participants to pre-register for GVF online modules. In response to this, the GVF re-confirmed its keenness to do so, immediately upon receiving the list of participants along with the desired details 15 days in advance of Pacific Endeavor.
7. Besides providing mentored capacity building, can the GVF provide a tailored classroom based onsite sessions? To this, the GVF reconfirms and commits to doing so.
8. Encourage participants to create a 'train the lead' approach to SATCOM Endeavor; encourage participating countries to send someone to SATCOM Endeavor who can also serve as a lead in a participant's home country.
9. Participants like to perform more scenario-based learning approach.
10. Assign smaller groups during hands-on to ensure everyone has participation.
11. Time management; there were numerous industry presenters in a short span of time. Altering between briefings and hands-on kept the course very interesting.

A unique honour was extended to GVF, by MCIP-PACOM. GVF Lead Riaz Lamak & POC for PE was invited to address the Senior Communicators on the Satcom Endeavor and its achievements so far. Followed by a tour of these officials to the Satcom endeavor session.

Expand Collaboration

Thus, two weeks of classroom and hands-on with emerging technologies was completed for first responders in humanitarian assistance and disaster relief preparedness. Understanding and experiencing latest systems and solutions makes all the difference for the first responder to choose the right fit and the right approach. It is equally important to have human resources ready and knowledgeable to quickly implement and establish communications. MCIP's Pacific Endeavor program is a unique opportunity for officials from participating nations to experience the latest technological solutions along with enhancing knowledge, building capacities, and relationships. The real success of this workshop is achieved when the knowledge gained during Pacific Endeavor is shared and scaled up with each of the respective nation's signal regiments. The GVF is keen to collaborate with each nation, in support of capacity building onsite along with all other HADR initiatives.

Satcom Endeavor

"The expanded collaboration that occurred at this year's Pacific Endeavor exemplifies the increasing extent to which military leadership and the satellite industry are working together to strengthen disaster preparedness through the use of space-based broadband solutions," said David Hartshorn, Secretary General of GVF. "We are honored to support such an important enterprise and look forward to building upon these achievements in the future."

"This initiative has taken another important step in saving lives," said Riaz Lamak, President, Mahdi Bagh Computers and a GVF Lead, PoC for Pacific Endeavor. " Our collaboration is for Capacity Building & Information Sharing, bringing the latest technology from our Industry for HADR resources. It is highly commendable that with completion of four Satcom Endeavors, there is now a rich resource of GVF Certified officials in each of the countries. With this, MCIP has created a registry of Skilled and GVF Certified resources, officials available in each country on APAN. This database is available to each of the nations for augmenting resources towards quick deployments in case of disaster relief efforts."

Integrasys hands-on tutorial

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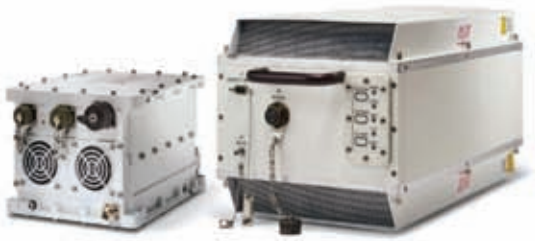

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Evolving regulatory challenges & the World Radiocommunication Conference 2019

The dynamics of the satellite industry, as best exemplified in today's accelerating innovations across its various market segments – including launch vehicle technology, satellite design and manufacture, new applications development, etc. – create new opportunities for growth within, and expansion of, the industry, and also for economic growth and societal improvement resulting from the benefits of these dynamics. But, hand-in-hand with this growth come new challenges – challenges that impact upon the policy and regulatory sphere.

The Global VSAT Forum Regulatory Working Group (RWG), the longest established of GVF's working groups, has for 20 years focused on dialogue with government policy and regulatory administrations, and with inter-governmental organisations, to improve the regulatory and market access conditions that facilitate a cost-effective operating environment for affordable satellite-based services. This environment is now undergoing significant change.

With the advent of the *New Space* age, and of the new LEO satellite revolution in not only communications but also in Earth observation and monitoring, and in scientific endeavour, new regulatory issues have come to the fore and the collective experience and expertise of the RWG has already risen to meet the evolving challenge.

The RWG brings together a non-partisan group of legal and regulatory experts from across the globe to share first-hand industry experience with national and international satellite regulators.

Through the RWG, members can tap the collective knowledge and expertise of GVF's global network of satellite industry contacts to keep abreast of emerging regulatory trends and developments in satellite policy.

The RWG also functions as the primary point of contact with national regulators and international organisations in the advocacy of improvements to satellite communications policy and promotion of progressive reforms to insure affordable, easily accessible service, spectrum availability, and orbital resources for users worldwide. *(www.gvf.org/regulatory.html)*

Following the re-affirmation by global governments of the importance of satellite spectrum during the 2015 ITU World Radiocommunication Conference (WRC-15), the co-ordination of the co-existence of the wireless and satellite industries has never been of greater importance.

GVF's global co-ordination of successful spectrum campaigns at the WRC-07 as well as WRC-15 conferences – where GVF and its allies defended the integrity of the L, C, Ku, Ka, Q and V-band spectrum – the RWG has already implemented global initiatives to closely track government proceedings to ensure that satellite communications interests continue to be strongly represented. The RWG has addressed the next steps to be taken in preparation for WRC-19, and is coordinating a global campaign with partners and allies, monitoring national spectrum proceedings in Asia, the Americas, Europe, the Middle East and Africa.

Increasing demand for spectrum requires proactive technical and strategic leadership from the satellite industry, and the RWG has led, and partnered with, numerous regional associations and governing bodies regarding the continuing need for viable access to spectrum for satellite services.

The RWG coordinates inputs into upcoming industry events and members are frequently invited as speakers and panellists to provide expert analysis, providing presentations, whitepapers, and regulatory comments to help educate regulators, and shape favourable satellite policy decisions.

The RWG is currently engaged in representations to administrations in every major region of the world.

The RWG continues to leverage its global experience with satellite regulation to provide guidance to regulators on best practices for fair, transparent, and efficient satellite licensing policies, taking every opportunity to urge regulators to adopt streamlined licensing requirements, fair fees, and blanket licensing or registration wherever possible, and continuing its advocacy for a global "Open Skies" policy.

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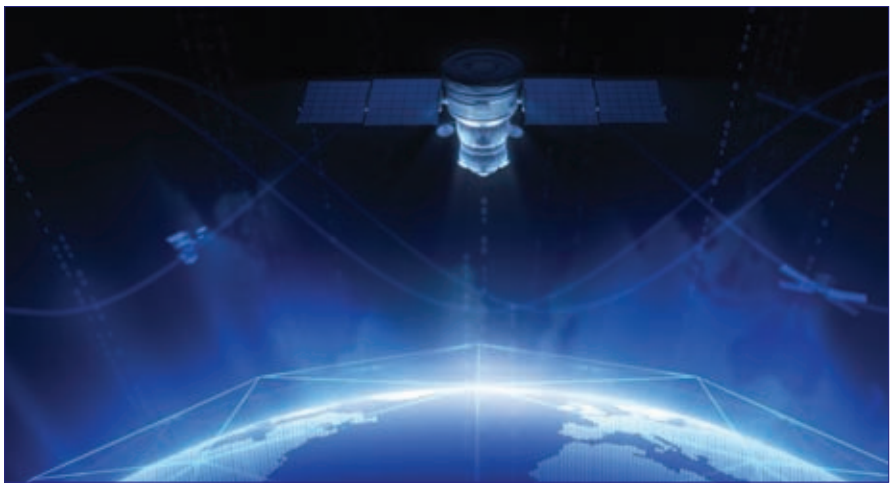

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Sustainability of Space Operations: Emerging New Space & Orbital Debris

Sustainability of space operations is one of the latest facets to be added to the remit of the Global VSAT Forum (GVF). Currently, GVF Secretary General David Hartshorn, is in engaged with a growing range of stakeholders and other subject-matter experts in developing a consensus-based best practice guideline focused on preserving sustainability for the various commercial, and other peaceful, uses of space.

Amongst various other meetings, held before and since, World Satellite Business Week in Paris in September 2017 saw the GVF leading a meeting about Orbital Debris Mitigation, discussing with NGSO and GSO industry stakeholders the challenges, market trends, potential for government and regulatory interventions in addressing the orbital debris issue. Contributing to the ongoing dialogue is the European Space Agency (ESA) Space Debris Office, focusing on recent trends and the potential further development of space sustainability guidelines developed to prevent and mitigate orbital debris with a focus on international coordination, space surveillance and risk models.

Space applications – commercially-based or scientifically-orientated, but peaceful in objectives – serve to protect and enhance people's lives all over the world as they contribute to communications, navigation, weather forecasting, natural resource management, environmental monitoring, climate modelling, and disaster mitigation early warning systems, etc.

As the commercial space industry embarks on the *New Space* age of innovative low Earth orbit business serving enhanced communications, advanced Earth observation, global navigation, cutting-edge exploration, accelerated economic development, and creative security applications – using satellites of widely varying scale, typically of much lower mass than today's typical GSO communications satellite, and often in planned constellations comprising tens, hundreds, even thousands of spacecraft – there has been a resurgence of concern about orbital debris as a specific phenomenon affecting current space applications. This concern results from the potential for physical and electromagnetic interference and is related to the potentially negative impact of orbital debris on the development of new technologies – technologies which require a secure space environment to ensure sustainability over the long term.

Cost of using space

Without space sustainability, the cost of using space will increase, potentially rendering it too expensive to continue to use at the very time when new technologies – in satellite manufacture, in launcher design, etc. – are reducing costs and making access to orbit open to more potential space stakeholders.

Currently more than 21,000 pieces of debris larger than around 10cm are being tracked in orbit around the Earth, and there are reportedly as many as 500,000 other, untracked, pieces larger than one cm. Debris colliding with any operational satellite will likely result in damage or destruction of the spacecraft. As these numbers continue to increase. So does the threat to space sustainability.

In response to this, various space agencies have identified a set of mitigation guidelines aimed at enabling space users to reduce the creation of space debris by, for example, limiting the orbital lifetime of spacecraft and launch vehicle stages after the end of their mission.

Over a number of years the United Nations Committee on the Peaceful Uses of Outer space (UN COPUOS) has evaluated various aspects of the long-term sustainability of outer space activities, and has addressed themes that include sustainable space utilisation supporting sustainable development on Earth, space debris, space operations and tools to support collaborative space situational awareness, space weather, and regulatory regimes and guidance for actors in the space arena.

Guidelines

A first set of 12 COPUOS guidelines were agreed in mid-2016 and February 2018 saw agreement on a further nine guidelines specifically intended to reduce the risk of collisions in space, as well as other harmful space activities. Though voluntary and non-binding, the guidelines were agreed by 87 UN member states, and whilst all counties are encouraged to incorporate them into their laws and regulations the 87 members are now supposed to include them in future national space-related legislation.

The nine guidelines most recently approved by the COPUOS working group cover a range of issues, including improved registration of space objects and sharing of information about them, performing conjunction assessments for all objects that have the ability to control their trajectories, addressing risks associated with the uncontrolled re-entry of space objects, and observing precautions when using lasers in outer space.

One of the guidelines, informally known as the 'small satellite guideline', calls on countries to take measures to increase the trackability of space objects, including small-size space objects, and calls on satellite operators to follow orbital debris mitigation guidelines to limit their long-term presence in "protected regions" of space after the end of their mission.

Seven more guidelines are in the pipeline though their future is unclear as the COPUOS working group's activities are coming to an end. Continuation of that work will be discussed at the next full meeting of COPUOS in June 2018, where the report on the nine new guidelines completed by the working group in February 2018 will be approved to send on to the UN General Assembly.

GVF, in wide collaboration with stakeholders with core interests in guaranteeing the continued sustainability of space operations, continues its leadership role in facilitating the development of a consensus-based satellite industry position on the current and the paradigm shifting emerging uses of the space around the Earth. A Memorandum of Understanding is in preparation.

Photo courtesy of SatProf

Interactive, simulator-based online training

With more than 30 learning courses, 15 certifications, and over 14,000 students, the GVF Training and Certification Program has been the standard for the satellite communications community since 2005. Interactive, simulator-based online training makes GVF training globally available, highly effective, efficient, and low cost.

GVF training is ideal for:

- VSAT field technicians and installers;
- Network Operations Center and Access Center technical staff;
- Teleport and broadcast uplink technicians;
- Ground equipment and link engineers;
- Marine satcom field technicians and engineers;
- Marine VSAT equipment operators (seafarers and crew);
- SNG truck/van operators;
- Mobile/autopoint terminal operators, including military and broadcast;
- Quick-deploy terminal operators, including military users; and
- Managers, commercial/sales staff, and support staff in satcom organizations.

The training programme is strongly supported by all sectors of the industry, including a formal resolution of endorsement by WBU-IMCG (formerly ISOG). Many major satellite operators, service providers, and manufacturers have integrated GVF training into their own staff development programmes.

Students or training organisations begin at www.gvf.org/training to explore the curriculum and certification paths. Upon registration, students receive individual login accounts to the dedicated learning system and work through their online courses at their own pace. Each course contains knowledge tutorials (many with animation and interactive simulations), followed by a quiz, and where applicable, a simulator-based skills test. Satcom Professional Certification students may register for a required hands-on skills test, offered by any of more than 100 GVF Examiners worldwide, who are either on-staff at participating organizations or offer testing sessions to the public. New courses, including specific training on using HTS, LEO, and MEO networks and on specialized equipment, are being continually developed in collaboration with satellite operators and equipment manufacturers.

Knowledge Center Subscription plan

Under the Knowledge Center Subscription plan, GVF now makes the entire suite of standard learning courses and certifications available for an affordable fixed annual subscription rate. Students may freely choose their courses, revisit them for refresher training and resources access, and renew their certification, at zero additional cost. Further, organizations may now enter into a Site License agreement, under which their entire staff is subscribed to the GVF curriculum for a heavily-discounted, single annual fee.

When certification requirements are met, the student may elect to be listed in the public directory of certified professionals, which serves as an excellent resource for organisations seeking expertise in their regions.

Separately, any organization or company which commits to its staff maintaining appropriate GVF certifications is now eligible to be recognized as an Accredited Organization for Training.

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Founded in 1976 by the 21 member-states of the Arab League, Arabsat has been serving the growing needs of the Arab world for over 40 years, operating from its headquarters in Riyadh-KSA and two satellite control stations in Riyadh and Tunis. Now one of the world's top satellite operators and by far the leading satellite services provider in the Arab world, it carries over 500 TV channels, 200 radio stations, pay-TV networks and wide variety of HD channels reaching tens of millions of homes in more than 80 countries across the Middle East, Africa and Europe—including an audience of over 170 million viewers in the Middle East and North Africa (MENA) region alone tuned into Arabsat's video "hotspot" at 26°E.

Operating a growing fleet of owned satellites at the 20°E, 26°E, 30.5°E, 39°E and 44.5°E, Arabsat is the only satellite operator in the MENA region offering the full spectrum of broadcast, telecommunications and broadband services. This capacity will continue to expand with the launching of new satellites, making Arabsat satellites' fleet the youngest in the region. Arabsat also maintains strategic partnerships with most of the world's leading satellite companies and VAS integrators. With the acquisition of Hellas Sat, one of the leading telecom groups in southeastern Europe, these partnerships and acquisitions continue to expand Arabsat's reach with new orbital slots and frequency rights. This allows customers to reach farther than ever and deliver content and state-of-the-art solutions to any end-viewers audience or business partner around the world.

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EchoStar Corporation is a premier global provider of satellite communication solutions. Headquartered in Englewood, Colo., and conducting business around the globe, EchoStar is a pioneer in secure communications technologies through its Hughes Network Systems and EchoStar Satellite Services business segments.

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Founded in 1977, Eutelsat Communications is one of the world's leading satellite operators. With a global fleet of satellites and associated ground infrastructure, Eutelsat enables clients across video, data, government, fixed and mobile broadband markets to communicate effectively to their customers, irrespective of their location. Over 6,700 television channels operated by leading media groups are broadcast by Eutelsat to one billion viewers equipped for DTH reception or connected to terrestrial networks. Headquartered in Paris, with offices and teleports around the globe, Eutelsat assembles 1,000 men and women from 44 countries who are dedicated to delivering the highest quality of service.

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General Dynamics SATCOM Technologies is a leading supplier of satellite communications products and services for video, voice and data worldwide. The company's wide range of products includes fixed, mobile, flyaway, VSAT and SATCOM-on-the-Move antennas and antenna systems; RF electronics including SSPAs and modular block converters; control systems and rack-mount transit cases. Additional products and capabilities include RF microwave components, such as filters and diplexers, and optical and radio telescopes. Many of the company's standard products are classified as "Ready-to-Go" ("RTG") and can ship to customers within thirty days of order acceptance to meet time-critical requirements.

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Gilat Satellite Networks Ltd is a leading global provider of satellite-based broadband communications. With 30 years of experience, it designs and manufactures cutting-edge ground segment equipment, and provides comprehensive solutions and end-to-end services, powered by its innovative technology. Delivering high value competitive solutions, the company's portfolio comprises a cloud based VSAT network platform, high-speed modems, high performance on-the-move antennas and high efficiency, high power Solid State Amplifiers (SSPA) and Block Upconverters (BUC).

Gilat's comprehensive solutions support multiple applications with a full portfolio of products to address key applications including broadband access, cellular backhaul, enterprise, in-flight connectivity, maritime, trains, defence and public safety, all while meeting the most stringent service level requirements.

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Hughes Network Systems, LLC is the global leader in broadband satellite technology and services for home and office. Its flagship high-speed satellite Internet service is HughesNet®, the world's largest satellite network with over one million residential and business customers across North America and Brazil. For large enterprises and governments, the company's HughesON® managed network services provide complete connectivity solutions employing an optimized mix of satellite and terrestrial technologies. The JUPITER™ System is the world's most widely deployed High-Throughput Satellite (HTS) platform, operating on more than 20 satellites by leading service providers, delivering a wide range of broadband enterprise, mobility and cellular backhaul applications. To date, Hughes has shipped more than six million terminals to customers in over 100 countries, representing approximately 50 percent market share, and its technology is powering broadband services to aircraft around the world.

Headquartered outside Washington, D.C., in Germantown, Maryland, USA, Hughes operates sales and support offices worldwide, and is a wholly owned subsidiary of EchoStar Corporation, a premier global provider of satellite operations.

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Tel: +44 20 7728 1000
Email: Contact Form
Internet: www.inmarsat.com
Contact: Jonathan Sinnatt
Job Title: Director of Global Communications

Inmarsat is the market leader in the provision of mobile satellite services, with the largest portfolio of global satellite communications solutions and value-added services on the market.

Its global sales and marketing activities are operated through five market-facing business units:

- Inmarsat Maritime, focusing on worldwide commercial maritime opportunities;
- Inmarsat US Government, focusing on US government opportunities, both military and civil;
- Inmarsat Global Government, focusing on worldwide (i.e. non-US) civil and military government opportunities;
- Inmarsat Enterprise, focusing on worldwide enterprise, energy, media and M2M opportunities; and
- Inmarsat Aviation, focusing on inflight voice, data, safety services and cabin connectivity, for both business and commercial air transport.

With a presence in more than 60 locations across every continent, its world-class products, services and solutions and 24/7/365 customer support facilities are available directly from Inmarsat, or – for the majority of customers – via the company's worldwide network of independent Distribution Partners (DPs) and Service Providers (SPs).

Photo courtesy of Shutterstock

GVF: Satellite...Solutions...The World

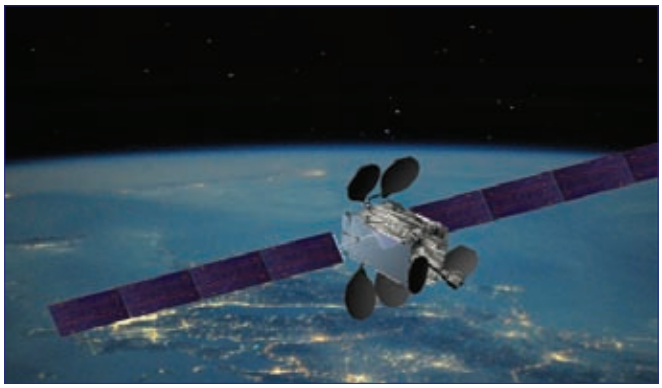
Name: INTELSAT
Address: 7900 Tysons One Place, McLean, VA 22102-5972, USA.
Tel: +1 703 559 6800
Fax: +1 703 559 7898
Email: Contact Form
Internet: www.intelsat.com
Contact: Dianne VanBeber
Job Title: VP, Investor Relations and Corporate Communications

Intelsat operates the world's first Globalized Network, powered by its leading satellite backbone, delivering high-quality, cost-effective video and broadband services anywhere in the world. Intelsat's Globalized Network combines the world's largest satellite backbone with terrestrial infrastructure, managed services and an open, interoperable architecture to enable customers to drive revenue and reach through a new generation of network services. Thousands of organizations serving billions of people worldwide rely on Intelsat to provide ubiquitous broadband connectivity, multi-format video broadcasting, secure satellite communications and seamless mobility services.

Name: KBZ GATEWAY
Address: Unit 611, Strand Square, No.53, Corner of Merchant Road and Bo Soon Pat Street, Pabedan Township, Yangon, Myanmar.
Tel: +95 01230 7018
Email: info@kbzgateway.com
Internet: www.kbzgateway.com
Contact: Virender Singh

The Kanbawza (KBZ) Group of Companies was founded by U Aung Ko Win in 1994 and now has more than 80,000 employees. It is one of the largest privately owned diversified group of companies in Myanmar and has a core principle to strengthening the country and its people.

KBZ Gateway Company Limited was developed to further extend the Group abilities through technology and maximize its ability to contribute to the industry and country. The company's ecosystem of partners can provide an end-to-end service ranging from international & national connectivity, supported by nextGen VSAT capability, mobile rooftop antennas and carrier neutral POPs, supported by a full range of professional services as an Oracle Gold partner.



Intelsat 33e

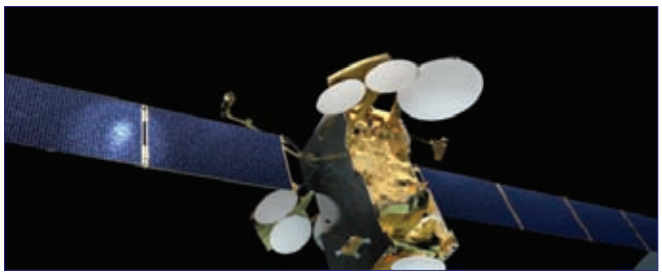


Photo courtesy of SES

Name: MEASAT
Address: MEASAT Teleport and Broadcast Centre, Jalan Teknokrat 1/2, 63000 Cyberjaya, Malaysia.
Tel: +60 (3) 8213 2188
Fax: +60 (3) 2380 6500
Email: sales@measat.com
Internet: www.measat.com
Contact: Raj Malik
Job Title: Senior Vice President, Sales

MEASAT is a premium supplier of communication and video services to leading broadcasters, Direct-To-Home (DTH) platforms and telecom operators. With capacity across six communication satellites, MEASAT provides services to over 150 countries representing 80 percent of the world's population across Asia, Middle East, Africa, Europe and Australia.

The MEASAT satellite fleet includes the state-of-the-art MEASAT-3, MEASAT-3a and MEASAT-3b satellites co-located at 91.5°E, supporting Asia's premium DTH and video distribution neighbourhood; MEASAT-2 at 148.0°E; and, MEASAT-5 at 119.5°E. In Africa, the AFRICASAT-1a satellite at 46.0°E provides satellite capacity across the African continent with connectivity to Europe, the Middle East, Malaysia and Singapore.

Working with a select group of world-class partners, MEASAT also provides a complete range of broadcast and telecommunications solutions. Services include UHD, HD and SD video play-out, video turnaround, co-location, uplinking, broadband and IP termination services.

Name: NEWTEC
Address: Laarstraat 5, B-9100 Sint-Niklaas, Belgium.
Tel: +32 (0) 3 780 65 00
Fax: +32 (0) 3 780 65 49
Email: sales@newtec.eu
Internet: www.newtec.eu
Contact: Thomas Van den Driessche
Job Title: Chief Executive Officer

Newtec specializes in designing, developing and manufacturing equipment and technologies for satellite communications. As a pioneer in the industry, Newtec is dedicated to creating new possibilities for the broadcast, consumer and enterprise VSAT, government and defence, cellular backhaul and trunking and mobility, offshore and maritime markets. Its products and technologies can be applied in a wide range of single and multiservice applications from DTH broadcasting, video contribution and distribution and disaster recovery and backbones for cellular backhauling, to small and medium enterprises, SCADA and oil and gas networks, aircrafts and vessels.

Name: ONEWEB
Address: 1400 Key Blvd, Level A - Suite #1, Arlington, VA 22209, USA.
Email: Contact Form
Internet: www.oneweb.world
Contact: Eric Béranger
Job Title: CEO

OneWeb's mission is to enable affordable Internet access for everyone and it is building a communications network with a constellation of Low Earth Orbit satellites that will provide connectivity to billions of people around the world. With more than 10 terabits per second of new capacity, it will transparently extend the networks of mobile operators and ISP's to serve new coverage areas, bringing voice and data access to consumers, businesses, schools, healthcare institutions and other end users.

Name: SAUDI NET LINK COMPANY
Address: Bldg 137 Makkah Road, Riyadh, Saudi Arabia.
Tel: +966 1 483 2139
Fax: +966 1 482 5283
Email: info@saudinetlink.com
Internet: www.saudinetlink.com
Contact: Rami Osman
Job Title: Project Manager

Saudi Net Link Company was established in the Kingdom of Saudi Arabia in 1995. One of region's leading tele-communications companies, it has offices in Jeddah, Riyadh and Al-Khobar. Saudi Net Link Company is a specialist communication company that over the past few years has expanded its operation to encompass a wide range of services.

SNL customers are large and small business organizations with complex networking requirements typically spanning multiple locations and categories of communications systems. Enterprise customers range from large multinational corporations, government agencies, utilities, energy companies and educational institutions to small and medium-sized businesses with multiple locations.

SNL owns five HUB gateways operating inside and outside the Kingdom of Saudi Arabia serving more than 2,000 remotes terminals in MENA and European countries.

Photo courtesy of Speedcast

Photo courtesy of Shutterstock

Name: SES
Address: Chateau de Betzdorf, Rue Pierre Werner, Betzdorf L-6815, Luxembourg.
Tel: +352 710 725 1
Email: Contact Form
Internet: www.ses.com
Contact: Steve Collar
Job Title: President and CEO

SES is a world-leading satellite operator and the first to deliver a differentiated and scalable GEO-MEO offering worldwide, with more than 50 satellites in Geostationary Earth Orbit (GEO) and 12 in Medium Earth Orbit (MEO). SES focuses on value-added, end-to-end solutions in two key business units: SES Video and SES Networks. At SES, the company connects and enables broadcast, telecom, corporate and government customers, and enriches the lives of billions of people worldwide.

Name: SKYCASTERS
Address: 520 South Arlington Road, Akron, OH 44306, USA.
Tel: +1 330 785 2100
Fax: +1 330 247 3964
Email: Contact Form
Internet: www.skycasters.com
Contact: Donald Jacobs
Job Title: Managing Member/Co-Founder

As one of the oldest and largest facilities-based VSAT resellers, Skycasters brings affordable broadband satellite internet access, satellite VPN equipmenttooltip, mobile satellite internet, and corporate data services to all types of organizations, including rural and underserved business locations. Its system is an excellent choice for multi-user business customers located in remote areas where conventional broadband data service is not available or cost-effective.

With satellite internet access, it doesn't matter how far the customer is from the telephone company's central office. Wherever you are throughout North and Central America, Skycasters delivers true broadband speed. Skycasters provides broadband satellite internet access and data service to thousands of business, government, educational and non-profit users in the US and abroad.

Name: SPEEDCAST
Address: Unit 4F, Level 1, Lakes Business Park, 12 Lord Street, Botany NSW 2019, Australia.
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Email: info@speedcast.com
Internet: www.speedcast.com
Contact: Pierre-Jean Baylier
Job Title: CEO

Speedcast is one of the world's most trusted providers of highly reliable, fully managed, end-to-end remote communication and IT solutions. The company utilizes an extensive worldwide footprint of local support, infrastructure and coverage to design, integrate, secure and optimize networks tailored to customer needs. With differentiated technology, an intense customer focus and a strong safety culture, Speedcast serves more than 2,000 customers in over 140 countries via 39 teleports, including offshore rigs and cruise ships, 10,000+ maritime vessels and 4,500+ terrestrial sites. Speedcast supports mission-critical applications in industries such as maritime, oil and gas, enterprise, media, cruise and government. Learn more at www.speedcast.com.

Name: TALIA
Address: 9A Margaret Street, London W1W 8RJ UK.
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Fax: +44 207 631 3343
Email: Contact Form
Internet: www.talia.net
Contact: Alan Afrasiab
Job Title: CEO and Founder

Talia is a top-tier provider of Internet, voice, and video services, recognised as a market leader throughout the Middle East, Africa, and Europe. Experts in satellite, voice, video, and broadcast communications, Talia provides global network coverage, enabling enterprises, PTTs, mobile carriers, and broadcasters to connect to the largest global meet me room, and linking the major regional telecoms hubs around the world.

With headquarters in the UK, Talia operates its own Teleport facility in Germany, and has support and sales offices in the US, UAE, Nigeria, South Sudan, Uganda and Iraq, making Talia ideally positioned to meet the demands of today's global market.

Talia provides solutions for enterprises, media companies, NGOs, and government agencies.

Photo courtesy of Shutterstock

Photo courtesy of Shutterstock

Name: TELESAT
Address: 1601 Telesat Court, Ottawa, Ontario, Canada K1B 5P4.
Tel: +1 613 748 0123
Email: Contact Form
Internet: www.telesat.com
Contact: Tom Eaton
Job Title: Vice President International Sales

Telesat is a leading global satellite operator, providing reliable and secure satellite-delivered communications solutions worldwide to broadcast, telecom, corporate and government customers. Headquartered in Ottawa, Canada, with offices and facilities around the world, the company's state-of-the-art fleet consists of 15 satellites plus the Canadian payload on ViaSat-1 with two new satellites under construction. An additional two prototype satellites are under construction and will be deployed in low earth orbit. Telesat also manages the operations of additional satellites for third parties.

Privately held, Telesat's principal shareholders are Canada's Public Sector Pension Investment Board and Loral Space & Communications Inc.

Name: VIASAT INC
Address: 6155 El Camino Real, Carlsbad, CA 92009, USA.
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Fax: +1 760 929 3941
Email: Contact Form
Internet: www.viasat.com
Contact: Steven Hart
Job Title: EVP, Engineering & Chief Technical Officer

ViaSat is in the business to connect the world. As a global broadband services and technology company, it is connecting international communities to the internet by offering residential internet service; enabling passengers and operations crews to stream high-bandwidth media, applications, and content when travelling globally on commercial, business or government aircraft and maritime vessels; and empowering international warfighters on the front lines of battle with real-time, secure internet-based intelligence, surveillance, and reconnaissance for high-requirement missions. Viasat delivers and protects information – when and where it is needed most – with trusted communications ground systems, infrastructure, and services.

Name: VT IDIRECT
Address: 13861 Sunrise Valley Drive, Suite 300, Herndon, VA 20171, USA.
Tel: +1 703 648 8002
Email: sales@idirect.net
Internet: www.idirect.net
Contact: Julie Bettinger
Job Title: Vice President, Corporate Marketing

VT iDirect® is a global leader in IP-based satellite communications. The company provides technology and solutions to enable service providers and satellite operator partners to optimize their networks, differentiate their services and profitably expand their business.

For more than 20 years, the VT iDirect organization has focused on meeting the economic and technology challenges across the satellite industry. Today, the product portfolio, branded under the name iDirect, sets new standards in performance and efficiency, making it possible to deliver voice, video and data connectivity anywhere in the world.

VT iDirect's parent company, Vision Technologies Systems, Inc. (VT Systems) and its subsidiaries are providers of engineering solutions, products and integrated systems and services. VT Systems is a wholly-owned subsidiary of Singapore Technologies Engineering Ltd (ST Engineering). As part of the larger ST Engineering family, the combined synergies enable expansive technology capabilities, leadership across multiple vertical industries, and broad access to global resources for VT iDirect's network of more than 350 partners.

iDirect Government™ is a wholly owned subsidiary of VT iDirect, formed in 2007 to better serve the US Government and defence communities.

Name: YAHSAT
Address: Al Falah City, Abu Dhabi, UAE.
Tel: +971 2 510 0000
Fax: +971 2 510 0001
Email: info@yahsat.ae
Internet: www.yahsat.com
Contact: Farhad Khan
Job Title: Chief Commercial Officer

Yahsat provides multipurpose satellite solutions (government and commercial) for broadband, broadcast, military, and communications use across the Middle East, Africa, Central and South West Asia. Based in Abu Dhabi, UAE and wholly owned by the Mubadala Development Company, the investment vehicle of the Government of Abu Dhabi, Yahsat is the first company in the Middle East and Africa to offer multi-purpose satellite services:

- YahClick – offers home solutions, business solutions and transportable solutions;
- YahService – offers managed solutions and government capacity; and
- YahLink – offers IP trunking solutions, corporate networking capacity and backhauling capacity.

Yahsat's first satellite Y1A was successfully launched in April 2011 and the company's second satellite Y1B was successfully launched in April 2012.

Al Yah 3, an all Ka-band satellite, and the first hybrid electric propulsion GEOStar-3™ satellite completed by Orbital ATK, was launched on an Ariane 5 rocket by Arianespace on January 25th, 2018 from Kourou in French Guiana.

Al Yah 3 will join Al Yah 1 and Al Yah 2 in helping to empower millions of people across the Middle East, Africa, South West Asia and Brazil to access affordable Internet access via Yahsat's high-speed satellite broadband service, YahClick. The service is designed to provide satellite broadband Internet to everyone, opening up new opportunities for every aspect of society from governments and enterprises to end users at home. Al Yah 3 will expand Yahsat's commercial Ka-band coverage to an additional 19 new markets in Africa, reaching 60 percent of the population. Furthermore, Al Yah 3 will serve Brazil, covering over 95 percent of its population. Al Yah 3 is due to begin delivering commercial services this year.

Photo courtesy of Shutterstock

Name: **ABS**
Address: O Hara House, 3 Bermudiana Road, Hamilton, HM08, Bermuda.
Tel: +1 441 295 7149
Email: info@absatellite.com
Internet: www.absatellite.com
Contact: Jim Simpson
Job Title: Chief Executive Officer

ABS is one of the fastest growing global satellite operators in the world. ABS offers a complete range of tailored solutions including broadcasting, data and telecommunication services to broadcasters, service providers, enterprises and government organizations.

ABS operates a fleet of satellites: ABS-2, ABS-2A, ABS-3A, ABS-4/Mobisat-1, ABS-6, and ABS-7. The satellite fleet covers over 93 percent of the world's population across the Americas, Africa, Asia-Pacific, Europe, the Middle East, CIS and Russia.

Headquartered in Bermuda, ABS has offices in the United States, United Arab Emirates, South Africa and Asia. ABS is majority owned by funds managed by the European Private Equity firm Permira.

Name: **ACCESS INTELLIGENCE**
Address: 9211 Corporate Blvd, Fourth Floor, Rockville MD 20850, USA.
Tel: +1 301 354 2000
Email: info@accessintel.com
Internet: www.accessintel.com
Contact: Jenn Heinold
Job Title: Senior Vice President, Events

Access Intelligence is a leading worldwide information and marketing company that provides unparalleled business intelligence and integrated marketing solutions in nearly a dozen global market sectors, including aerospace and satellite. Access Intelligence publishes *Via Satellite* magazine and produces the annual SATELLITE Conference and Exhibition in Washington, DC.

Name: **ACCESS PARTNERSHIP**
Address: 9th Floor, Southside, 105 Victoria Street, Westminster, London SW1E 6QT, UK.
Tel: +44 20 3143 4900
Fax: +44 20 8748 8572
Email: london@accesspartnership.com
Internet: www.accesspartnership.com
Contact: Gregory Francis
Job Title: Managing Director

Since 1999, Access Partnership has helped some of the world's leading ICT organisations gain access to new markets, drive sales, meet regulatory goals, shape policy outcomes and introduce new services into previously underserved markets. The company's expertise in the areas of government relations and regulatory affairs means it is able to provide clients with a range of solutions that create the commercial environment they need to flourish.

Name: **ADVANTECH WIRELESS**
Address: 657 Orly Avenue, Montreal, QC, H9P 1G1, Canada.
Tel: +1 514 420 0045
Fax: +1 514 420 0073
Email: info.canada@advantechwireless.com
Internet: www.advantechwireless.com
Contact: Cristi Damian
Job Title: Vice President, Business Development

Advantech Wireless delivers intelligent broadband communications solutions that achieve excellence, maximize performance and minimize operational costs, all with uncompromising quality. Ultimately, the company helps people stay connected and informed by designing and manufacturing the most advanced terrestrial and satellite communication technologies on the planet.

Name: **AETHERIC ENGINEERING LTD**
Address: Katana House, Fort Fareham Trading Estate, Fareham PO14 1AH, UK.
Tel: +44 1329 823583
Fax: +44 1329 288675
Email: sales@aetheric.co.uk
Internet: www.aetheric.co.uk
Contact: Peter Milne
Job Title: Principal Consultant

Satellite communications, design and technology specialist, Aetheric Engineering is an independent telecommunications consultancy, established in 1989. The company offers advice and support throughout all project phases from feasibility and design studies, through procurement and project management, to installation, commissioning and operation of telecommunications networks, especially satellite communication systems. Support is available for both civilian and military systems.

Name: **AGUIAR & MARSIGLIA**
Address: Zentena 3175, C1425CCB, Buenos Aires, Argentina.
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Fax: +54 11 4802 5647
Email: henochaguiar@yahoo.com
Contact: Henoch Aguiar

Consultancy based in Argentina and GVF Correspondent for the Southern Cone.

Name: **AIRBUS**
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Tel: +33 5 62 19 40 40
Email: Contact Form
Internet: www.airbus.com

A commercial aircraft manufacturer, with Space and Defence as well as Helicopters Divisions, Airbus is the largest aeronautics and space company in Europe and a worldwide leader. Airbus has built on its strong European heritage to become truly international – with roughly 180 locations and 12,000 direct suppliers globally. The company has aircraft and helicopter final assembly lines across Asia, Europe and the Americas, and has achieved a more than sixfold order book increase since 2000.

Name: **ALKAN TELECOM**
Address: 8 El-Gazaer Street, New Maadi, Cairo 11435, Egypt.
Tel: +202 2516 9722
Fax: +202 2516 9560
Email: info@alkantelecom.com
Internet: www.alkancit.com

Alkan Telecom is a leading telecommunications solutions provider and systems integrator that offers a wide-set of turnkey solutions to meet the ongoing demands of fixed and wireless operators in the Middle East and Africa. With regional presence in most of MEA countries, Alkan Telecom has always been able to support its clients' business needs, from inception to completion, going through all phases from planning right through operation.

Name: **APPLIED INSTRUMENTS, INC**
Address: 5230 Elmwood Avenue, Indianapolis, IN 46203, USA.
Tel: +1 317 782 4331
Fax: +1 317 786 9665
Email: info@appliedin.com
Internet: www.appliedin.com
Contact: Tom Haywood
Job Title: President

Applied Instruments designs and manufactures RF test equipment used in the satellite and cable television sectors of the telecommunications industry. Product lines include signal measurement meters, test signal generators and signal switches. Users of Applied Instruments' equipment include the major satellite and cable television service providers and their contractors and equipment manufacturers.

Name: **APPLICATION TECHNOLOGY STRATEGY**
Address: Georgetown, Texas, USA.
Tel: +1 512 943 0454
Email: bruce@applicationstrategy.com
Internet: www.applicationstrategy.com
Contact: Bruce Elbert
Job Title: President

ATS is committed to the success of new and existing networks, application systems and organizations that employ broadband technologies, satellite and wireless communications, and information technology. Its experience in satellite communications, both in the space segment and ground segment, allows it to better assist clients that are considering how this medium can address earthly needs. ATS is an expert in preparing program plans and cost-reduction analyses that provide a foundation for sound decisions.

Name: **APT SATELLITE COMPANY**
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Email: info@apstar.com
Internet: www.apstar.com
Contact: Cheng Guangren
Job Title: Executive Director & President

Based in Hong Kong, APT Satellite Company ("APT Satellite") operates a fleet of five satellites, namely APSTAR-5, APSTAR-6, APSTAR-7 and APSTAR-9. APSTAR-5C and APSTAR-6C are currently under construction, they will replace APSTAR-5 and APSTAR-6 respectively in 2018. The footprints of the fleet cover Asia, Middle East, Oceania, and most part of Europe and Africa, extending services to over 75 percent of the world's population. Currently distributing 600+ TV channels around the world including HBO, Disney, Sony Pictures, NBCU, RTL-CBS, EBU, GMA, TVBI, TVn, Celestial Tiger etc, APT Satellite is also supplying transponder capacity to a variety of DTH platforms, as well as to media networks for video contributions across the world.

Name: **AQYR**
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Tel: +1 603 402 7100
Fax: +1 603 521 6099
Email: info@aqyrtech.com
Internet: www.aqyrtech.com
Contact: Rory Eddings
Job Title: Director Sales and Marketing

AQYR is a wholly owned subsidiary of Windmill International, Inc. For over twenty-five years, Windmill International, Inc. has been considered one of the defence industry's business leaders in program management, engineering, training, technology and software development. Headquartered in Nashua, New Hampshire, the veteran-owned company has built an excellent reputation with its customers as a highly efficient and skilled solutions-provider.

Name: **ARABIC AND ISLAMIC BROADCASTING UNION**
Address: Octave House, Empire Way, Wembley, Middlesex, HA9 0RH, UK.
Tel: +44 20 8903 8898
Fax: +44 20 8903 9880
Email: info@aibu.tv
Internet: www.aibu.tv

The Arab Islamic Broadcasting Union (AIBU), formed in 2013 in the United Kingdom, is an organization that represents members of the television and radio industry across the Arab and Islamic world.

Name: **ARQIVA**
Address: Crawley Court, Winchester SO21 2QA, UK.
Tel: +44 1962 823434
Email: enquiries@arqiva.com
Internet: www.arqiva.com
Contact: David Crawford
Job Title: Managing Director Satellite & Media

Arqiva is a leading UK communications infrastructure company enabling a vibrant digital economy. Every day the company's infrastructure and associated services enable millions of people and machines to connect wherever they are through TV, radio, mobile WiFi and the Internet of Things (IoT).

The company is an independent provider of telecom towers, with around 8,000 active sites, and the only national provider of terrestrial television and radio broadcasting.

Name: **ASIA PACIFIC ZONE SYSTEMS**
Address: 13, Jalan Astaka U8/83, Seksyen U8, Bukit Jelutong Industrial Park, 40150 Shah Alam, Selangor Darul Ehsan, Malaysia.
Tel: +60 3 7846 2288
Fax: +60 3 7846 5588
Email: sales@zonesystems.net
Internet: www.zonesystems.net

Zone Systems A/S is a premier provider and integrator of commercial satellite and terrestrial broadcast systems, maintaining readiness and providing daily operational services to customer's broadcast systems worldwide. Over the past 20+ years Zone Systems A/S has successfully worked with leading broadcasters and telecommunications corporations deploying complete full turnkey solutions specializing in the field of TV and FM radio broadcast transmission over terrestrial and satellite networks.

Photo courtesy of Shutterstock

Name: ASISAT
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Mobile: +52 500 0687

ASISAT is a Mexican organisation that represents its members in forums and conferences of the satellite industry, related to telecommunications, technical matters, DTH, regulatory and international affairs. The organisation serves as the Mexico Correspondent for the GVF.

Name: ASSI - THE INDONESIAN SATELLITE ASSOCIATION
Address: Cisanggarung Street No. 2, 2nd Floor, Room 26, Bandung 40155, West Java, Indonesia.
Tel: +62 22 452 1658
Fax: +62 22 452 1657
Email: admin@assi.or.id
Internet: www.assi.or.id
Contact: Feti Fatimah

ASSI is an association to protect the interests of Indonesia's satellite business, especially through regulations that favour domestic industries and encourage the development of satellite business in Indonesia, providing technology and business education to the public and encouraging the creation of national potential in the field of satellite technology and space. Serves as the GVF's Indonesian Correspondent.

Name: AVANTI COMMUNICATIONS
Address: Cobham House, 20 Black Friars Lane, London EC4V 6EB, UK.
Tel: +44 207 749 1600
Email: webenquiry@avantiplc.com
Internet: www.avantiplc.com

Avanti connects people wherever they are – in their homes, businesses, in government and on mobiles.

Through the HYLAS satellite fleet and more than 180 partners in 118 countries, the network provides ubiquitous internet service to a quarter of the world's population. Avanti delivers the level of quality and flexibility that the most demanding telecoms customers in the world seek.

AvL TECHNOLOGIES
designs for ultimate performance

Name: AVL TECHNOLOGIES
Address: 15 North Merrimon Avenue, Asheville, NC 28804, USA.
Tel: +1 828 250 9950
Fax: +1 828 250 9938
Email: Contact Form
Internet: www.avltech.com
Contact: Krystal Dredge
Job Title: Marketing Manager

AvL Technologies, Inc. is a privately held US company specializing in the design, development and production of mobile satellite antennas and positioner systems. With corporate headquarters based in Asheville, North Carolina, and a regional office located in the UK, AvL is able to offer superior service and support to customers around the world. AvL provides systems integrators with positioner and complete antenna system products, product development and services that maximize the technical and commercial benefits for their customers with cost, performance, quality and reliability requirements. AvL provides solutions and support for satellite ground terminals for SNG, mobile broadband Internet access, disaster relief, oil & gas data backhaul, and defense & homeland security customers throughout the world.

Name: AZURE SHINE
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Fax: +886 3 3615 877
Email: azure.shine@azureshine.com.tw
Internet: www.azureshine.com.tw

Azure Shine produces almost all kinds of DTH and VSAT satellite antennas. With the capacity of one million sets per month, the company sells its products all over the world. Asia, Europe, America and Africa - it's not overstating to say that where you can see the sky you can find an antenna marked Azure Shine.

Name: BALKAN TELEKOM
Address: Kisikli Caddesi, Haluk Turksoy Sokak, No 4/1 34662, Altunizade, Istanbul, Turkey.
Tel: +90 216 651 8550
Email: Contact Form
Internet: www.balkantelekom.net

Balkan Telekom is one of the leading satellite service providers in Turkey with its experienced and dynamic structure. Offering uninterrupted, economical and reliable communication solutions to its customers, Balkan Telekom provides satellite internet services especially in Turkey, Turkic Republics, Middle East and Africa regions.

Name: BALL AEROSPACE
Address: 10 Longs Peak Drive, Broomfield, CO 80021, USA.
Tel: +1 303 939 6100
Fax: +1 303 460 2315
Email: info@ball.com
Internet: www.ball.com/aerospace
Contact: Jackie Berger
Job Title: Director, Marketing & Communications

Ball Aerospace, a business of Ball Corporation, has more than 3,000 employees located in Colorado, the greater Washington, D.C. area, Ohio, New Mexico and Missouri, and has hired more than 700 new employees in the past two years.

Ball's unique work across many disciplines has delivered groundbreaking technologies that have helped customers to perform beyond expectation. A snapshot of recent achievements includes: developing and manufacturing the entire integrated antenna suite for the F-35 Lightning II; designing and building Kepler/K2 Space Telescope, which has discovered more than 2,500 confirmed exoplanets; developing technologies that allow people to overcome physical limitations, such as the Semi-Autonomous Motorcar (SAM); building two next-generation polar-orbiting operational weather satellites, NOAA-20 (formerly JPSS-1) and Suomi-NPP; designing and building the optical system for the James Webb Space Telescope, which will be the largest mirror ever flown in space; and providing several critical national security programs.

Name: BAYLINK
Address: Dudu Dotan 5/4, Netanya, Israel.
Tel: +972 50 2230309
Fax: +972 9 7686610
Contact: Tsachi Dahan
Job Title: Owner

Baylink focuses on executive strategic consulting for satcom industry players. Clients include MNOs, service providers, Integrators, satellite companies and vendors. Baylink specialises in expanding the Go-to-Market strategy on vertical markets while understanding the industry landscape.

GVF: Satellite...Solutions...The World

Name: BHS TELECOMMUNICATION COMPANY
Address: No.401, Building No.1, Dubai Media City, Dubai, UAE.
Tel: +971 4551 5523
Fax: +971 4551 5524
Email: info@bhs-media.com
Internet: www.bhs-media.com
Contact: Hamid Rahmani

BHS delivers content to any place throughout the world. BHS' comprehensive infrastructure and capabilities for signal delivery including satellite, terrestrial and IP connectivity, make it simple for all of its clients to distribute their contents globally.

Name: BLUETOWN
Address: P. H. Lings Alle 4, 2100 Copenhagen Ø, Denmark.
Tel: +45 31 66 00 07
Email: info@bluetown.com
Internet: www.bluetown.com
Contact: Mogens Birk
Job Title: VP Partnerships & Alliances

BLUETOWN is a global IT company that provides low-cost, sustainable Wi-Fi solutions to connect people in rural areas of the world. BLUETOWN was founded in 2006 and is headquartered in Copenhagen.

BLUETOWN operates globally with offices in Denmark, USA, India, Tanzania, Ghana, Peru and Dubai with a total workforce of 70 employees.

Name: BOEING
Address: 100 North Riverside, Chicago, Illinois 60606, USA.
Tel: +1 312 544 2000
Email: Contact Form
Internet: www.boeing.com

Boeing is the world's largest aerospace company and leading manufacturer of commercial jetliners and defense, space and security systems. A top US exporter, the company supports airlines, US and allied government customers in 150 countries. Boeing products and tailored services include commercial and military aircraft, satellites, weapons, electronic and defense systems, launch systems, advanced information and communication systems, and performance-based logistics and training.

Name: CAMPO RICO GROUP
Address: Teleport at Canovanas Site, Canovanas, Puerto Rico.
Tel: +1 917 293 6489
Email: info@camporicogroup.com
Internet: www.camporicogroup.com
Contact: Jose Luis Rodriguez
Job Title: Chief Executive Officer

Campo Rico was established to improve the lives of Spanish speaking people everywhere. There are many ways this can be achieved - but they all depend on good communication. This is the fundamental aim of Campo Rico – to provide enhanced communication facilities for disadvantaged Hispanic people. The initial focus will be Puerto Rico and Cuba, but will be expanded in the next few years, to include the rest of Latin America.

Name: C-COM SATELLITE SYSTEMS
Address: 2574 Sheffield Road, Ottawa, Ontario, Canada K1B 3V7.
Tel: +1 613 745 4110
Fax: +1 613 745 7144
Email: info@c-comsat.com
Internet: www.c-comsat.com
Contact: Drew Klein
Job Title: Director - International Business Development

Established in 1997, C-COM Satellite Systems Inc. is a world leader in the design, development and manufacture of commercial grade, fully motorized, auto-pointing mobile antennas (iNetVu®) for the delivery of broadband Internet to remote locations.

The company has been a pioneer in the one-button, auto-deploy VSAT market – with over 7,000 units in the field, in over 100 countries. The iNetVu® brand is synonymous with reliability, affordability and superior technology.

Name: CETEL GMBH
Address: Falkenweg 1, D-53809 Ruppichteroth, Germany.
Tel: +49 2295 90878 0
Fax: +49 2295 90878 22
Email: contact@ce-tel.com
Internet: www.ce-tel.com
Contact: Guido Neumann
Job Title: Managing Director

CETel is a German provider of satellite, fibre and wireless enabled communications solutions. It designs, implements and operates independent, end-to-end connectivity services and networks. Customers take advantage of fully managed services, operated from the company's own teleport in Germany as well as technical support and consulting services.

Name: CISCO SYSTEMS
Address: 170 West Tasman Dr. San Jose, CA 95134, USA.
Tel: +1 800 553 6387
Email: Contact Form
Internet: www.cisco.com
Contact: Karen Walker
Job Title: SVP and Chief Marketing Officer

Cisco is the worldwide leader in IT. The company has shaped the future of the Internet by creating unprecedented value and opportunity for customers, employees, investors and ecosystem partners and has become the worldwide leader in networking - transforming how people connect, communicate and collaborate.

Name: CLARKE BELT 2.0
Address: 22 King Street South Suite 300, Waterloo Ontario N2J 1N8, Canada.
Tel: +1 904 388 2999
Email: mark.brady@att.net
Contact: Mark Brady

The company is a start-up looking to deploy an innovative IP satellite constellation. For further information contact Mark Brady.

Photo courtesy of Shutterstock

Name: COM-RAC
Address: 5802 Bob Bullock C1, Suite 328c-278, Laredo, TX 78041, USA.
Tel: +1 713 893 8073
Email: info@com-rac.com
Internet: www.com-rac.com
Contact: Stuart Browne
Job Title: Chief Executive Officer

COM-RAC Corporation provides network operators with integrated telecom terminal kits called a TeleStation®. Each station terminal may be configured for: small cell BTS, long range Wi-Fi access points, TV white space base/remotes, IoT monitor and control, video surveillance, and weather monitoring, and are powered by a solar PV power supply.

Name: COMSYS
Address: PO Box 65749, London N13 9BW, UK.
Tel: +44 1727 832288
Fax: +44 208 7317982
Email: susan@comsys.co.uk
Internet: www.comsys.co.uk
Contact: Susan Bull
Job Title: Senior Consultant

As well as consultancy, Comsys offers multi-client reports which have earned a reputation in themselves as reliable, realistic and accurate. This is because it undertakes its own primary research, visiting countries and companies in all regions of the world. Comsys has also built market databases which have been compiled from direct research over the past 19 years and these form the basis of insight into the events, trends and developments which are available to its clients.

Name: COMTECH EF DATA
Address: 2114 West 7th Street, Tempe, AZ 85281, USA.
Tel: +1 480 333 2200
Fax: +1 480 333 2540
Email: sales@comtechefdata.com
Internet: www.comtechefdata.com
Contact: Sue Lassandro
Job Title: Director, Marketing

Comtech EF Data Corp. is a leading supplier of satellite bandwidth and link optimization. Its high-performance satellite communications infrastructure solutions feature ground breaking efficiency, robust intelligence and unparalleled horsepower. Commercial and government users around the world utilize its solution suite to reduce OPEX/CAPEX and to increase throughput for the most demanding fixed and mobile networks.

Name: COOLLINK
Address: 267A, Etim Inyang Crescent,Victoria Island, Lagos, Nigeria.
Tel: +234 1 271 02 52 to 6
Email: sales@coollink.ng
Internet: www.coollink.ng
Contact: Shahin Nouri
Job Title: Chief Executive Officer

With the headquarters in Lagos, Coollink.ng (Coollink) is an Internet Service Provider and System Integrator with nationwide coverage, supporting its customers and partners through its presence in Abuja, Port Harcourt and Kano and through its vast network of partners across all 36 states of Nigeria.

With strategic alliances and partnerships, the company has been able to extend its coverage and services to several other countries across Africa and the Middle East.

Name: CPI SATCOM & MEDICAL PRODUCTS DIVISION
Address: 6385 San Ignacio Avenue, San Jose, CA 95119, USA.
Tel: +1 669 275 2744
Email: satcommarketing@cpii.com
Internet: www.cpii.com/satcom
Contact: Doug Slaton
Job Title: Marketing Product Manager

The Satcom Products Group of CPI's Satcom & Medical Products Division (CPI SMP) is a worldwide leader in uplink amplifier products and systems for satellite communications. CPI has played a pivotal role in the satcom industry since its inception.

The first satellite projects, including INTELSAT and CONUS, were supported by CPI, which was then part of Varian Associates, Inc.

Today, CPI's scope and global reach is unmatched, having shipped over 50,000 high power amplifiers to uplink stations in over 150 countries. CPI satcom products for satellite uplink and troposcatter applications are available in all standard frequencies from S-band to V-band.

CPI SMP's Satcom Products Group is uniquely equipped to be your one-stop HPA subsystem supplier for standard and emerging satcom applications, whether for GaN-based solid state BUCs and SSPAs, travelling wave tube amplifiers (TWTAs) or klystron power amplifiers.

CPI's Satcom Products Group is also a global leader in the design and manufacture of uplink klystrons and advanced millimetre wave klystron technology, with frequency ranges up to 700GHz.

Name: DATAPATH
Address: 2205 Northmont Parkway, Duluth, GA 30096, USA.
Tel: +1 678 597 0300
Email: Contact Form
Internet: www.datapath.com
Contact: Chief Operating Officer
Job Title: Brad Majeres

DataPath leverages 25 years of experience and projects across 40 countries to bring best practices to everything: "From terminals to teleports and all the tools in between™. The company focuses on remote, distributed or at-risk environments, where reliable communications are a must. This includes government, broadcast, emergency response, and industrial markets."

The core of the company revolves around engineering expertise and life-cycle support for satellite terminals ranging in size from tactical man-portable units to vehicle mounted auto-acquire systems to master earth stations for teleports. In addition to custom systems development, DataPath manufactures a line of rapid deployment portable satellite antenna products.

However, DataPath has broad experience providing products and services that span the entire continuum of a network architecture.

Photo courtesy of Shutterstock

Name: DATASAT COMMUNICATIONS
Address: Brookmans Park Transmission Station, Great North Road, Hatfield, Herts AL9 6NE, UK.
Tel: +44 1707 244474
Email: sales@datasat.com
Internet: www.datasat.com
Contact: Phil Emmel
Job Title: Managing Director

A remote communications specialist delivering secure and reliable networks into hard to reach places and the world's harshest environments. A leading service provider of VSAT satellite communications, the company combines intelligent outdoor wireless technology to design and build end-to-end multi-service networks over a single infrastructure.

Name: DIADEM TECHNOLOGIES
Address: Unit F,13th Floor Hai Shang-Jie Zuo Building, NO.578 YingKou Road, Shanghai, China PR.
Tel: +86 157 2117 7848
Email: diadem@diadem-tech.cn
Internet: www.diadem-tech.cn

DiaDem Technologies (DiaDem) has a global open-minded vision and is dedicated to developing and partnering together on the commercialization of attractive advanced technologies, products, solutions and applications.

DiaDem is successfully involved in projects with customers and partners from the EU, Asia, Africa, the Middle East as well as the Chinese domestic Market.

Name: EGYPTSAT
Address: 24 Ebour Buildings, Salah Salem Road, Cairo, Egypt 11371.
Tel: +20 2 2261 2787
Fax: +20 2 2405 3949
Email: sales@egyptsat.com
Internet: www.egyptsat.com

EgyptSat provides high-speed Internet connection, using the Express AM22 satellite, which offers a hot spot beam pointed just over the Middle East, from the Indian Ocean to the Atlantic Ocean coast. This extensive coverage for all countries in the Middle East, Europe and Africa provides customers with an excellent range of geographic locations. Due to the strong signal obtained from the satellite, a fairly small antenna is used to get a reliable and fast Internet connection.

Name: EMC
Address: 3044 N. Commerce Parkway - Miramar, FL 33025 USA.
Tel: +1 954 538 4000
Email: Contact Form
Internet: www.emcconnected.com

EMC specializes in mission-critical communications and content for organizations and people on the move in the most remote locations. At sea, on land and in the air, the company provides seamless, reliable connectivity and access. EMC leverages its wholly-owned and operated satellite-terrestrial cellular broadband network with fully meshed Multiprotocol Label Switching (MPLS) interconnected teleports.

On July 27, 2016, Global Eagle Entertainment (GEE) acquired EMC to become a worldwide leader in end-to-end connectivity and media services for the rapidly growing global mobility markets across air, sea and land.

GEE brings a rich product portfolio that complements EMC's connectivity services, including a full suite of entertainment content through longstanding relationships with Hollywood studios.

Name: EMEASAT
Address: 1306 King Street, Santa Cruz, CA 95060, USA.
Tel: +1 408 807 8515
Fax: +1 408 904 5240
Email: info@emeasat.com
Internet: www.emeasat.com
Contact: Mary Ellen Hannon
Job Title: Managing Director

EmeaSat supplies equipment and services for satellite communication and broadcasting systems. The products the company delivers have been carefully selected. To assure customers receive true value and excellent service the company has narrowed down the list of brands it offers to include only those products that meet the highest standards of performance and reliability.

Name: EMP
Address: Fountain Court, 2 Victoria Sq, Victoria Street, St Albans, Hertfordshire AL1 3TF, UK.
Tel: +44 207 099 5546
Email: paul.stahl@uk-emp.co.uk
Internet: www.uk-emp.co.uk
Contact: Paul Stahl
Job Title: Executive Director

EMP, (Event Management Partners), was launched in 2004 to develop and manage a niche portfolio of highly specialised technology focused conferences. EMP is particularly preoccupied with the practical application of various ICTs to selected vertical and emerging markets.

Name: ETL SYSTEMS
Address: Coldwell Radio Station, Madley, Hereford, HR2 9NE, UK.
Tel: +44 1981 259020
Fax: +44 1981 259021
Email: info@etlsystems.com
Internet: www.etlsystems.com
Contact: Andrew Bond
Job Title: Sales Director

ETL Systems has been designing and manufacturing RF equipment since 1984, and from 2003 onwards benefited from the new management of Ian Hilditch and Dr Esen Bayar. In 2013 it received its third Queens Award for Enterprise, marking impressive growth in International Trade, and is now one of the world's leading RF manufacturers to the satellite industry.

Located at its purpose built secure facility next to the BT Madley Satellite Earth Station, ETL boasts RF testing facilities, software design, automated circuit board assembly, concept design areas, pick and place machinery as well as machining workshops. This means that design, production and maintenance can be carried out in-house under the umbrella of the newly awarded ISO 9001 Quality Management System.

ETL's heritage is in designing satellite signal routing solutions for broadcasters, who demand hi-levels of RF performance, as well as redundancy and resilience. This expertise has been expanded to cover government, defence, marine, private VSAT networks as well as global satellite operators.

ETL continues to invest heavily in Research & Development,

to ensure that its RF components and rack mounted equipment meet the changing needs of the satellite industry.

Name: EUROCONSULT
Address: 86 Boulevard de Sebastopol, 75003 Paris, France.
Tel: +33 1 49 23 75 30
Email: Contact Form
Internet: www.euroconsult-ec.com
Contact: Pacôme Révillon
Job Title: Chief Executive Officer

Euroconsult is a leading global consulting firm specializing in space markets. As a privately-owned, fully independent firm, it provides first-class strategic consulting, develops comprehensive research and organizes executive-level annual summits and training programs for the satellite industry. With over 30 years of experience, Euroconsult is trusted by 600 clients in over 50 countries. It has a multi-cultural team of over 30 full-time experts based in France, the United States, Canada and Japan, complemented by a network of senior affiliate consultants.

Name: EVERARD SOLUTIONS
Address: 16 Bricknell Ave, Bredon, Tewkesbury, Gloucestershire GL20 7QH, UK.
Tel: +44 7818 033524
Email: brian.everard@btinternet.com
Contact: Brian Everard
Job Title: Managing Director

An independent IT networking and telecommunications consultancy with over 25 years of managerial experience, knowledge and expertise gained in a wide range of voice and data communications systems, from radio to fixed and mobile satellite systems, delivering services to UK and multiple international offices over a global WAN.

Name: EXPEDITION COMMUNICATIONS
Address: 2501 E 28th Street, Suite 102, Signal Hill, CA 90755, USA.
Tel: +1 877 410 8101
Email: ushq@expeditioncommunications.com
Internet: www.expeditioncommunications.com
Contact: Dean Eldridge
Job Title: President & CEO

Expedition Communications was founded upon delivering innovative yet affordable communications solutions. Its team of professionals is staffed with licensed and experienced communication experts specializing in installation and maintenance of VSAT, satellite internet services and other communication systems equipment. All of these are maintained and run by professional satellite providers, installers and other communication industry experts.

Name: FRAUNHOFER IIS
Address: Am Wolfsmantel 33, 91058 Erlangen, Germany.
Tel: +49 9131 776-0
Fax: +49 9131 776-2019
Email: info@iis.fraunhofer.de
Internet: www.iis.fraunhofer.de
Contact: Thoralf Dietz
Job Title: Head of Corporate Communications

The Fraunhofer-Gesellschaft is the leading organization for applied research in Europe. Its research activities are conducted by 69 institutes and research units at locations throughout Germany.

The Fraunhofer-Gesellschaft employs a staff of 24,500, who work with an annual research budget totalling more than 2.1 billion euros.

The Fraunhofer Institute for Integrated Circuits IIS is one of the world's leading application-oriented research institutions for microelectronic and IT system solutions and services. It is the largest of all Fraunhofer Institutes.

Name: GEOFF DANIELL COMMUNICATIONS
Address: PO Box 70179, The Willows, Pretoria 0041, South Africa.
Tel: +27 12 807 0482
Email: geoff.daniell@gvf.org
Contact: Geoff Daniell
Job Title: Telecommunications Consultant

Leading South African communications consultant and GVF correspondent for sub-Saharan Africa, Mr Daniell has many years of experience with satellite communications in the region.

Name: GESTION DE PROJETS INT'L
Address: 198 FX Garneau, Boucherville, Quebec J1B 6R6, Canada.
Tel: +1 514 569 8049
Email: db@advapro.com
Contact: Denis Beaudoin

Name: GILAT SATCOM
Address: 21 Yegia Kapayim Street, PO Box 7144, Petach-Tikva, 49130, Israel.
Tel: +972 3 925 5050
Email: sales@gilat.net
Internet: www.gilat.net
Contact: Gal Kohn
Job Title: Vice President Sales

Gilat Satcom is a communications solutions provider that offers satellite and fibre-based connectivity solutions in Africa, Asia and the Middle East. With successful deployments in 50 countries, Gilat consistently delivers high-quality, cost-effective and efficient communication solutions to telcos, ISPs, governments, enterprise customers and international organizations. The company operates three international teleports in Europe and the Middle East, fourteen hubs/PoPs in Africa and two PoPs in Europe.

Name: GILBERT ADANUSA TELECOMMUNICATIONS CONSULTING
Address: PO Box 8051, Accra, Ghana.
Tel: +233 21 772 233
Fax: +233 21 224 797
Email: gilbert.adanusa@gvf.org
Contact: Gilbert Adanusa
Job Title: President

Provides satellite communications consultancy services including support for market intelligence and promotion of partnerships for satellite systems and services, local representation, etc.

Mr Adanusa, who previously worked as a regulatory advisor to the Ghana Ministry of Communications, also serves as the GVF's West Africa Correspondent.

Name: GILL GOVIER LTD
Address: Hinxworth, SG7 5HB, UK.
Tel: +44 1462 743522
Email: info@govieronline.co.uk
Internet: www.govieronline.co.uk

Established in September 2004, the company provides a broad portfolio of management solutions. Its services are based on over 20 years' practical experience within the satellite communications community delivering complex programmes and acting as a catalyst for strategic and organisational change.

Name: GLOBAL IP
Address: 222 N Sepulveda Blvd, Suite 1750, El Segundo, CA 90245, USA.
Tel: +1 424 367 3500
Fax: +1 424 277 0076
Email: info@goglobalip.com
Internet: www.goglobalip.com
Contact: Yaron Tchwella
Job Title: SVP Sales and Marketing

Global IP was established with the aim of building a state-of-the-art IP network, based on its first high capacity satellite, GiSAT-1, dedicated to the Sub-Saharan region. GiSAT-1 which is scheduled for launch early 2019 has a new digital payload, and offers twice the capacity as previous digital payload designs. Enabling affordable broadband access – a key driver to economic growth – to over 800 million people in 39 countries in the region, the network is built around the 150 Gbps Ka satellite, which is larger than all other Ka satellites located over Africa, combined.

Name: GLOBECOMM SYSTEMS
Address: 45 Oser Avenue, Hauppauge, NY 11788-3816, USA.
Tel: +1 631 231 9800
Fax: +1 631 231 1557
Email: Contact Form
Internet: www.globecommsystems.com
Contact: Paul Scardino
Job Title: SVP, Sales Engineering and Marketing

Globecomm is a leading engineering-driven, global connectivity provider serving media, maritime, enterprise and government markets in over 100 countries.

It develops smart connectivity solutions to address customer issues across a broad spectrum of areas, including system design and integration, managed communication services including mobile and IoT, media services and mission critical networks. Globecomm is known for its unique ability to provide robust connectivity to the most remote locations under the most treacherous conditions. Globecomm is dedicated to improving communications and leverages its world class, global network to offer end-to-end, managed service communication's solutions worldwide.

Name: HAWK EYE 360
Address: 196 Van Buren Street, Suite 450, Herndon, VA 20170, USA.
Tel: +1 571 203 0360
Email: info@he360.com
Contact: Chris DeMay
Job Title: Chief Operating Officer & Founder

HawkEye 360 is developing a constellation of formation-flying micro-satellites in Low Earth Orbit (LEO) to execute a unique radio frequency (RF) spectrum monitoring and geolocation capability. The company's analytics engine generates reports on signals that can be used to track and monitor global transportation networks, detect distress alerts, assist with emergencies and much more. By implementing this exciting new concept, HawkEye 360 will provide highly accurate maritime domain awareness, establish a spectrum inventory, and develop insight into how signals are being used globally. HawkEye 360 will be uniquely positioned to provide space-based geolocation data that can help prevent and mitigate SATCOM interference.

Name: HELLAS SAT
Address: Konstantinoupoleos 48, Koropi, GR-19400, Athens, Greece.
Tel: +30 210 615 9700
Fax: +30 210 664 5433
Email: Contact Form
Internet: www.hellas-sat.net
Contact: Christodoulos Protopapas
Job Title: Chief Executive Officer

Hellas Sat is a premium satellite communications solutions provider founded in 2001 and acquired by Arabsat, the 6th largest satellite operator in the world in 2013. Its satellites are located at 39°E orbital slot offering excellent coverage over Europe, Middle East and Southern Africa.

From 39°E, the company serves leading DTH operators by delivering content to more than three million households, while providing cost-effective solutions to enterprises and governments that want to expand connectivity to every location of their network in our coverage areas.

From its ground facilities in Greece and Cyprus, it provides a wide range of managed services to meet customers' communications needs when and wherever is required.

Name: HISPAMAR
Address: Praia do Flamengo, 200 /17 Andar Flamengo, RJ 2210-901, Brazil.
Tel: +55 21 2555 4800
Email: Contact Form
Internet: www.hispamar.com.br

HISPAMAR is HISPASAT's Brazilian subsidiary. Ten years in the Pan-American telecommunications market, HISPAMAR satellites have become a reference in the sector, connecting the Americas as well as both sides of the Atlantic.

The company aims to enable communication, information and knowledge through innovative and reliable satellite services, contributing to the development of the business of its customers and quality services.

Name: HISPASAT
Address: Paseo de la Castellana, 39, 28046 Madrid, Spain.
Tel: +34 91 710 25 40
Email: Contact Form
Internet: www.hispasat.com
Contact: Carlos Espinos Gomez
Job Title: Chief Executive Officer

HISPASAT is the Spanish satellite communications operator, a leader in the distribution of content in Spanish and Portuguese. With more than 25 years of experience, the HISPASAT Group maintains an important presence on the Iberian Peninsula and in Latin America, where it is now the fourth satellite operator. HISPASAT has solidly positioned itself in high growth markets and has a stable strategic client base. HISPASAT distributes more than 1,250 television and radio channels through its powerful fleet of satellites and is a key driver for the Spanish aerospace industry.

Name: HORIZON SATELLITE SERVICES
Address: PO Box 502343, Office Number 406, Zee Tower, Dubai Media City, UAE.
Tel: +971 4 391 5122
Fax: +971 4 391 2906
Email: Contact Form
Internet: www.horizonsat.com

Established in 2001, HorizonSat is recognized as a major satellite service provider, covering the Middle East, Asia, Africa and Europe. Committed to quality and continuous development of its product range, HorizonSat has strengthened its presence in these regions.

Systems are reliable and deliver a trouble-free service for broadcasters and content owners who have to cater to large audiences around the world. With access to an array of satellites, HorizonSat currently operates on Eutelsat, ABS, Apstar and Azercom satellites. Its broad range of services include managed broadband solutions, iDirect networks (with and without VNO), IP trunking, VoIP and GSM backhauling, media and broadcast services including video distribution, contribution and turnaround.

Name: HUCKWORTHY
Address: 1025 Connecticut Ave NW, Suite 1000 Washington, DC 20036, USA.
Tel: +1 202 649 0058
Email: info@huckworthy.com
Internet: www.huckworthy.com
Contact: David Howgill
Job Title: President

Huckworthy LLC is a Washington DC certified HUBZone Small Business and DOD Mentor Protégé Program participant under The Boeing Company, specialized in emerging technologies in the mobile wireless, satellite, security and energy related industries.

Huckworthy brings over 25 years international experience launching new technology and methodologies into international markets, with a long history in product management and building strategic partnerships.

Huckworthy provides encrypted communications services and integrated solutions for tactical, intelligence, disaster response, security and carrier enabled mobile networks; alongside consulting Services and International Distribution Networks for cutting edge US and UK technologies.

Name: INFORMA
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Tel: +44 20 7017 5000
Email: headoffice@informa.com
Internet: www.informa.com

Informa is a leading business intelligence, academic publishing, knowledge and events group.

It helps customers in hundreds of professional, commercial and academic communities connect and learn, and create and provide access to content and intelligence so they can work smarter and make better decisions faster.

Name: INSTER
Address: Avda. Rita Levi Montalcini, 2 28906 - Getafe, Spain.
Tel: +34 9138 02022
Email: info@inster.es
Internet: www.inster.es
Contact: José Juan Pina Camacho
Job Title: Commercial Director

INSTER is a leader in the sectors of satellite communications, defence (Control, Communications and System Integration), telecommunications (Mission-Critical Systems), air navigation, airport, maritime and ports, security, civil protection and engineering & R&D.

Name: INTEGRASYS
Address: Esquilo, Las Rozas, 28230 Madrid, Spain.
Tel: +34 91 631 6846
Fax: +34 91 631 7156
Email: info.sales@integrasys-sa.com
Internet: www.integrasys-space.com
Contact: Alvaro Sanchez
Job Title: Sales & Marketing Director

INTEGRASYS S.A. is a privately owned SME software development, engineering and integration company specialising in the telecommunication and broadcasting markets.

Name: INTELLIAN TECHNOLOGIES
Address: 18-7, Jinwisandan-ro, Jinwi-myeon (Chungho-ri), Pyeongtaek-si, Gyeonggi-do 17709, Korea.
Tel: +82 31 379 1000
Fax: +82 31 377 6185
Email: sales@intelliantech.com
Internet: www.intelliantech.com
Contact: Rachel Lee
Job Title: Global Marketing Manager

Intellian is a leading global provider of stabilized satellite antenna systems. Built upon its patented RF, stabilization and tracking technologies, products support a wide range of industries, including commercial maritime, offshore energy, defense & intelligence and luxury yachting. The company's comprehensive range of antenna systems includes satellite TV, VSAT, Global Xpress and FleetBroadband solutions.

Name: INTELSAT GENERAL CORPORATION
Address: 7900 Tysons One Place, 12th Floor, McLean, VA 22102, USA.
Tel: +1 703 270 4200
Email: sales.inquiries@intelsatgeneral.com
Internet: www.intelsatgeneral.com
Contact: Skot Butler
Job Title: President

Intelsat General (IGC) is a wholly owned subsidiary of Intelsat, operator of the world's first Globalized Network. IGC provides its government and commercial customers with high-quality, cost-effective, communications solutions via Intelsat's leading satellite backbone and terrestrial infrastructure. Customers rely on IGC to provide secure and seamless broadband connectivity, video communications, and mobility services for mission-critical operations anywhere on the globe through an open, inter-operable architecture.

Name: INTERNET SOLUTIONS
Address: The Campus, Le Mans Building, 57 Sloane Street, Bryanston, South Africa.
Tel: +27 011 575 1000
Fax: +27 011 576 1000
Email: info@is.co.za
Internet: www.is.co.za
Contact: Tony Walt
Job Title: Chief Solutions and Operating Officer

Internet Solutions (IS) is a Pan-African communications service provider and has been providing innovative end-to-end telco solutions and related services for more than 20 years. Today, IS is at the forefront of Internet Protocol-based technologies building solutions and services tailored to the increasingly complex demands of organisations across the enterprise, public sector, global carrier and growing small-to-medium business sectors.

Name: INTERSPUTNIK International Organization of Space Communications
Address: 2nd Smolensky pereulok 1/4, 121099 Moscow, Russia.
Tel: +7 495 641 4420
Fax: +7 495 641 4440
Email: dir@intersputnik.com
Internet: www.intersputnik.com
Contact: Vadim Belov
Job Title: Director General

Founded on November 15, 1971 under the Agreement on the Establishment of the Intersputnik International System and Organization of Space Communications, the Intersputnik International Organization of Space Communications (Intersputnik) is an intergovernmental satellite organization headquartered in Moscow, Russian Federation. Intersputnik can be joined by the Government of any state, which shares the principles of its activity. Presently, Intersputnik has twenty six member countries, which represent virtually all geographic regions from Central America to South-East Asia, and from Europe to Africa. The Governments of the Intersputnik member countries appointed twenty four Signatories from among national

telecommunications organizations and telecommunications administrations.

Intersputnik's mission is to contribute to the consolidation and expansion of economic, scientific, technological and cultural relations using satellite telecommunications, video and audio broadcasting, and to support cooperation and coordination of the efforts of the member countries aimed at designing, procuring, operating and expanding an international satellite telecommunications system.

Name: **IRIDIUM**
Address: 1750 Tysons Boulevard, Suite 1400 McLean, VA 22102, USA.
Tel: +1 703 287 7400
Fax: +1 703 287 7450
Email: Contact Form
Internet: www.iridium.com
Contact: Matthew J. Desch
Job Title: Chief Executive Officer

Iridium Communications Inc. is the only satellite communications company that offers truly global voice and data communications coverage. A technology innovator and market leader, Iridium, in collaboration with its vast partner network, is advancing the way global enterprises conduct daily mission-critical activities through reliable, low-latency communications services.

Iridium's 66 low-Earth orbiting (LEO) cross-linked satellites – the world's largest commercial constellation – operate as a fully meshed network.

Name: **IRWIN COMMUNICATIONS**
Address: 1750 K Street NW, Suite 350, Washington DC 20006, USA.
Tel: +1 202 223 1016
Email: sirwin@irwincom.com
Internet: www.irwincom.com

Irwin Communications is an international telecommunications consultancy specializing in satellite communications and its role in information and communications technology. For over 20 years, the company has helped its clients develop new products, enter new markets, establish strategic relationships, obtain market information and increase the efficiency of their communications systems.

Name: **ISAT AFRICA**
Address: PO Box 500459, 105, Building 10, Dubai Internet City, Dubai, UAE.
Tel: +971 4 3695050
Fax: +971 4 3624300
Email: info@isatafrica.com
Internet: www.isatafrica.com

iSAT Africa is a UAE based company and a subsidiary of Wananchi Group Holdings, a fast growing fixed satellite solution service provider in Africa.

iSAT's satellite solutions, backed by powerful satellites, teleport infrastructure and latest chosen technology solutions are unique in the industry, whether it's for transmission of video, data or voice services.

Name: **ISOTROPIC NETWORKS**
Address: W2835 Krueger Rd, Lake Geneva, WI 53147, USA.
Tel: +1 262 248 9600
Email: Contact Form
Internet: www.isosat.net
Contact: Hank Zbierski
Job Title: Chief Catalyst

IsoTropic Networks is a global, solutions based provider of satellite Internet services. IsoTropic owns and operates its teleport facilities and is widely recognized as a premier iDirect Host Network Operator, (HNO). Its engineering team can integrate satellite, fibre and copper in a seamless fashion to provide reliable, robust communications solutions anywhere on the planet, anytime you need them.

Name: **ITC GLOBAL**
Address: 3520 S. Sam Houston Parkway E, Suite #400, Houston, TX 77047, USA.
Tel: +1 727 898 3835
Email: Marketing@itcglobal.com
Internet: www.itcglobal.com
Contact: Ian Dawkins
Job Title: Chief Executive Officer

Part of the Panasonic family, ITC Global was founded in 2001 and it specializes in satellite-based communications for industrial operations in extreme environments, including deep-water energy exploration, remote mining and transoceanic shipping. Today ITC Global is the number one provider of satellite communications networks to the mining industry and among the top three providers to the oil and gas industry.

Name: **IVR TECHNOLOGIES**
Address: 555 West Fifth Street, 31st Floor, Los Angeles, CA 90013, USA.
Tel: +1 213 634 1522
Email: Contact Form
Internet: www.ivr.com
Contact: Barry Sher
Job Title: Vice-President Business Development

IVR Technologies is a leading software development company in the mobile and next-generation carrier network for mobile and voice over internet protocol (VoIP) enhanced services and real-time billing solutions. It is a full service firm providing pre and post-sale engineering support and professional on-site services for Talking SIP software installation, configuration, training and customizations.

Name: **JONES DAY**
Address: 51 Louisiana Avenue, N.W. Washington, D.C. 20001-2113, USA.
Tel: +1 202 879 3630
Fax: +1 202 626 1700
Email: Contact Form
Internet: www.jonesday.com
Contact: Bruce Olcott
Job Title: Partner

Bruce Olcott has a broad range of experience in communications law and policy. His practice focuses on regulatory and transactional issues involving wireless and wireline services, including satellite, cellular, internet, fibre-optic, and broadband communications technologies. Bruce has assisted clients in developing innovative commercial and private communications services and in securing domestic and international authorizations for the acquisition, construction, and operation of networks.

He represents clients in rule making and consultations before regulatory authorities, often seeking the elimination of legal and regulatory barriers to the provision of new services.

Name: **JONSA TECHNOLOGIES**
Address: No. 206 Cheng Kung 3 Rd, Nan Kang Industrial Park, Nantou City, Taiwan.
Tel: +886 49 2260666
Fax: +886 49 2260675
Email: saccount@jonsa.com.tw
Internet: www.jonsa.com.tw

JONSA is a leading global provider of stabilized satellite antenna products. Built upon its patented RF, design structural oriented, stabilization and upstream and downstream process integrations of manufacturing, the company's products support a wide range

of industries, including commercial, offshore/oceanic environment, defence, disaster, rescue area & weather data analysis and so on. Its comprehensive range of antenna systems includes satellite TV, VSAT, WISP, and mast mounting bracket solutions.

Name: **KACIFIC**
Address: 10A Institution Hill, 239664 Singapore.
Tel: +65 67 34 37 83
Email: info@kacific.com
Internet: www.kacific.com
Contact: Christian Patouraux
Job Title: Chief Executive Officer

Kacific is a next-generation broadband satellite operator. Working through local partners, its satellites deliver fast internet bandwidth empowering public services, businesses and consumers in urban areas, rural villages and remote communities in territories with highly dispersed pockets of population. Its first satellite, Kacific-1 brings affordable broadband in the archipelago countries of the Pacific and South East Asia. With direct-to-the-building speeds of up to 100Mbps, this satellite will substantially improve the access to affordable broadband for all islanders, local businesses and collective connectivity systems.

Name: **KASKILO COMMUNICATIONS GMBH**
Address: Am Buchenhang 3, D-82031 Grünwald, Germany.
Tel: +49 151 1560 1035
Fax: +49 89 64 24 89 69
Email: Matthias.Spott@kaskilo.space
Internet: www.kaskilo.space
Contact: Matthias Spott
Job Title: Chief Executive Officer

Kaskilo is an early-stage company seeking to leverage the tremendous business opportunities in NewSpace and become a disruptive leader in future commercial satellite communications. The company is striving to play a leading role in the emerging NewSpace arena of LEO (Low Earth Orbit) communication satellite constellations by differentiating itself with a dedicated focus on Industrial Internet of Things (IIoT) applications and customers.

Name: **KOLAGEN TELECOM**
Address: 27 BP 805 Abidjan 27.
Tel: +225 22 46 51 67
Email: info@kolagen-telecom.com
Internet: www.kolagen-telecom.com

KOLAGEN TELECOM West Africa is part of the GVF community providing Internet and satellite communication services to NGOs, government services and corporate companies in Cote d'Ivoire. KOLAGEN TELECOM West Africa is a SatADSL solution main distributor for Ivory Coast and BePartner for Newtec in the region.

With its internal skilled resources (all GVF certified), KOLAGEN TELECOM West Africa also acts as a service integrator in the West and Central Africa region, enabling satellite service providers to get deeper down in the value chain to meet customer 'end-to-end' and full managed service requirements.

Name: **KRATOS TTS**
Address: 5971 Kingstowne Village Parkway, Suite 200 Alexandria, VA 22315, USA.
Tel: +1 703 254 2000
Email: Contact Form
Internet: www.kratostts.com

The Kratos Technology & Training Solutions Division specializes in information technology, satellite communications and training to help customers achieve consistently higher levels of performance. Kratos is also a lifecycle training solutions developer, specializing in assuring the readiness, reliability and operational effectiveness of Warfighter and C5ISR systems.

Name: **KYMETA**
Address: 12277 134th Court NE, Suite 100, Redmond WA 98052, USA.
Tel: +1 425 896 3700
Email: Contact Form
Internet: www.kymetacorp.com
Contact: Nathan Kundtz, Ph.D
Job Title: President & CEO

Kymeta makes connectivity as simple and available as a view of the sky. Satellites provide a global network of available high-throughput bandwidth. Until now there hasn't been a way to easily access it, except to a limited extent. Kymeta's satellite technology and services make it easy to bring connectivity to cars, planes, boats and much more. Global access, anywhere, anytime, while on the move.

Name: **LEOSAT ENTERPRISES**
Address: 3573 Southwest 10th Street, Pompano Beach, Florida 33069, USA.
Tel: +1 202 888 3495
Email: info@leosat.com
Internet: www.leosat.com
Contact: Mark Rigolle
Job Title: Chief Executive Officer

LeoSat was formed to leverage proven satellite communications technology which would be deployed in a unique way to develop a new low-earth-orbit (LEO) satellite constellation providing a truly global, enterprise grade, high-speed and secure data network.

Based in Washington DC, LeoSat is currently working with Thales Alenia Space to manufacture and launch a constellation of up to 108 Ka-band communications satellites. The high-throughput satellites (HTS) will be interconnected through laser links, effectively creating an optical backbone in space which is about 1.5 times faster than terrestrial fibre backbones. Start of the launch of the constellation is expected in 2019.

Name: **LINTASARTA**
Address: Menara Thamrin 12th Floor, JL. MH Thamrin Kav.3, Jakarta 10250, Indonesia.
Tel: +62 21 230 2345
Fax: +62 21 230 3567
Email: support@lintasarta.co.id
Internet: www.lintasarta.net
Contact: Alfi Asman
Job Title: Business Director

Founded in 1988, Lintasarta is one of the most comprehensive and advanced information and communication technology service providers in Indonesia, connecting businesses throughout the length and breadth of the archipelago, bringing data communication, business information services and Internet even to remote areas.

Name: **LIQUID TELECOMMUNICATIONS LTD**
Address: 5th Floor, Ebene Mews, 57 Cybercity, Ebene, Mauritius.
Tel: +230 466 7620
Email: Contact Form
Internet: www.liquidtelecom.com
Contact: Nic Rudnick
Job Title: Chief Executive Officer

Liquid Telecom is the leading independent data, voice and IP provider in eastern, central and southern Africa. It supplies fibre optic, satellite and international carrier services to Africa's largest mobile network operators, ISPs and businesses of all sizes. It

also provides payment solutions to financial institutions and retailers, as well as award winning data storage and communication solutions to businesses across Africa and beyond.

Name: LONDON SATELLITE EXCHANGE
Address: 31 rue des Cosmonautes, 31402 Toulouse Cedex 4, France.
Tel: +33 5 62 19 62 19
Email: Contact Form
Internet: www.airbus.com

The London Satellite Exchange is a wholly owned division of Airbus and is the commercial satellite capacity procurement centre for Airbus and its Paradigm Secure Services division in Britain, which handles the Skynet 5 services contract. The milsatcom capacity in UHF and X-band also is managed by LSE.

Name: MAHDI BAGH COMPUTERS PVT LTD
Address: 9, Angel, Road No. 6, Kalyani Nagar, Pune 411006, MS, India.
Tel: +91 20 2665 8831
Fax: +91 20 4004 6560
Email: service.support@mbcin.com
Internet: www.mbcin.com

Mahdi Bagh Computers belongs to the highly acclaimed and prestigious Mahdi Bagh Group of Companies which has been in business for over 115 years, and is recognized as one of the oldest and most reputed business houses. It is the one-stop-shop, addressing the entire value chain in the ground segment related to satellite communication. Getting your VSAT network up and running quickly is its priority. Its team of qualified and experienced professionals ensures time schedules are met and high quality workmanship to benchmark industry standards.

Name: MANSAT
Address: No. 10 Global House, Station Road, Ballasalla, Isle of Man IM9 2AE, UK.
Tel: +44 1624 825164
Email: Contact Form
Internet: www.mansat.com
Contact: Chris Stott
Job Title: Chief Executive Officer

Established in May of 1998, ManSat Limited is a Manx registered and Manx owned private company limited by shares and headquartered in the Isle of Man with representation in the United Kingdom and the United States.

ManSat was established in the Isle of Man specifically to bring commercial efficiencies to the traditional satellite filing process for the global satellite industry

Name: MARLINK
Address: 137 rue du Faubourg St Denis, 75010 Paris, France.
Tel: +33 1 53 35 95 00
Fax: +33 1 53 35 82 20
Email: sales.europesouth@marlink.com
Internet: www.marlink.com

Marlink is the pioneer of business critical communication solutions for customers operating in remote environments. The company is the largest technology-independent satellite communication and digital solutions provider serving the maritime and enterprise markets. Marlink's multi-band communication services covering Ku, Ka, C and L-band extended with mobile and terrestrial links, enable over 200,000 customers to operate in an ever smarter, safer and more profitable way. With over 75 years' experience in developing innovative business critical communication solutions, Marlink's legacy is to deliver the benefits of a digital and connected world to its customers' remote operations. Today Marlink is the leading maritime communication and maritime VSAT operator in the world.

Name: MAXIS BERHAD
Address: Level 8, 11, 14 - 25, Menara Maxis, Kuala Lumpur City Centre, Off Jalan Ampang, 50088 Kuala Lumpur, Malaysia.
Tel: +60 03 2330 7000
Fax: +60 03 2330 0590
Email: Contact Form
Internet: www.maxis.com.my
Contact: Nasution bin Mohamed
Job Title: Chief Financial and Strategy Officer

It is the leading communications service provider in Malaysia, enabling individuals, families and businesses to do more in an always-on-world. Its customers increasingly immerse themselves in an ever expanding universe of connected applications, and the company are obsessed with providing an unmatched end-to-end internet experience – bringing together advanced always on connectivity and always great tech care.

Name: MEDIA BROADCAST SATELLITE GmbH
Address: Erdfunkstelle 1, 61250 Usingen, Germany.
Tel: +49 6081 100 - 2411
Email: satellite@media-broadcast.com
Internet: www.mb-satellite.com
Contact: Andreas Rohde
Job Title: Head of Marketing

Media Broadcast Satellite, operator of one of the world's largest teleports, has successfully been designing, implementing and operating satellite services for global customers since the late 1970's.

Through its own teleport in Usingen near Frankfurt, Media Broadcast Satellite provides customised solutions for broadcast, data, teleport and data centre applications. Satellites from 70° East to 60° West can be reached through more than 140 antennas in Ku, Ka and C-band.

In order to provide maximum security and stability for the solutions, Media Broadcast Satellite operates a manned NOC 24/7/365 and fully redundant RF, IT and power infrastructure. To underline the approach of high quality services "Made in Usingen/Germany", the company holds relevant certificates like ISO27001 IT & Data Security and maintains engineering teams to support customers at all stages of transmission, distribution and service management. Media Broadcast Satellite's value chain covers standard services as well as fully managed services for DTH platforms (SD/HD), data networks and teleport co-location/gateways.

Name: MERCANTILE COMMUNICATIONS
Address: Hitti Pokhari, Durbar Marg, Kathmandu, PO Box 66, Nepal.
Tel: +977 1 4440773
Fax: +977 1 4427614
Email: info@mercantile.com.np
Internet: www.mos.com.np
Contact: Bijay Pant
Job Title: Chief Executive Officer

Mercantile has been at the forefront of the Internet evolution and is a cutting edge Internet Service Provider (ISP) in Nepal. Mercantile pioneered the concept of providing Internet Service in Nepal when the popularity of Internet was just beginning in the United States of America. Mercantile in fact has become the first company that led the nation in introducing new and appropriate information technology by giving individuals and small businesses the ability to use the Internet as a tool to make their lives more productive and their businesses more profitable.

Mercantile is continually developing a new and innovative suite of services that make it a faster, easier and smarter Internet experience.

Name: MICROSPACE COMMUNICATIONS
Address: 3100 Highwoods Blvd, Suite 120, Raleigh NC 27604, USA.
Tel: +1 919 850 4500
Fax: +1 919 850 4518
Email: Contact Form
Internet: www.microspace.com
Contact: Greg Hurt
Job Title: Vice President Sales & Marketing

In 1988, Microspace Communication developed a technology utilizing economical and highly reliable satellite broadcasting to deliver critical data and audio content for its clients. As organizations needs for connectivity increased, Microspace expanded its service offerings to include a variety of options to satisfy its clients video, data and audio delivery needs.

Microspace now offers wireless, satellite and internet solutions for dozens of unique applications and the list of services and markets served continues to grow.

Name: MISSION MICROWAVE
Address: 9924 Norwalk Boulevard, Santa Fe Springs, CA 90670, USA.
Tel: +1 951 893 4925
Email: Contact Form
Internet: www.missionmicrowave.com
Contact: Dr. Jason W. May
Job Title: Director, Business Development

Mission Microwave Technologies, Inc., was founded in 2014 to create the next generation of Solid-State Power Amplifiers (SSPAs) and Block Upconverters (BUCs). It utilizes advanced GaN transistors, unique power combining technology, and novel full-system designs to create the industry's most efficient, lightweight, and compact high-power SSPA's. Its management team has more than 100 years of combined experience supplying high-performance, high-reliability SSPA's to commercial, military, and space customers.

Name: MOBAX GROUP
Address: 74 Regency Drive, Route 21 Corporate Park, Irene, South Africa.
Tel: +27 12 345 4007
Email: info@mobaxgroup.com
Internet: www.mobaxgroup.com

Mobax Group is an Investment and Holdings company with its Head Office in South Africa. Mobax Group's subsidiaries have a track record over many years, and are recognized for delivery of professional and high quality engineering, project and technical services to Telecommunication Network Operators and corporate clients in Africa. Mobax Group's business model comprises both geographical and technological diversification. Mobax Group's business philosophy is based on providing quality and cost effective services to its respective clients.

Name: MORGAN SPACE
Address: Suite 723, Fairmont Tower, Sheikh Zayed Road, Dubai, UAE.
Tel: +971 4 304 2350
Email: info@morgan-space.com
Internet: www.morgan-space.com
Contact: Wail Hamid
Job Title: Director

Morgan Space is a private licensed VSAT operator which offers low cost satellite connectivity solutions in terms of: GSM backhauling; broadband internet access for all business sectors including; mobile operators; enterprises, NGOs, financial sectors and government entities. Morgan provides internet solutions and reliable connectivity for these businesses in remote locations and rural areas, as well as in urban areas where reliable and secure services are needed.

ND SATCOM

Name: ND SATCOM
Address: Graf-von-Soden-Strasse, D-88090 Immenstaad, Germany.
Tel: +49 7545 939 0
Fax: +49 7545 939 8780
Email: info@ndsatcom.com
Internet: www.ndsatcom.com
Contact: Dr Michael Weixler
Job Title: Head of Product Management and Marketing

With over three decades of experience, ND SatCom is the premier supplier of and integrator for innovative satellite communication equipment systems and solutions to support customers with critical operations anywhere in the world. Customers in more than 130 countries have chosen ND SatCom as a trusted and reliable source of high-quality and secure turnkey and custom system-engineered communication solutions. The company's products and solutions are used in more than 200 transnational networks in government, military, telecom and broadcast environments. ND SatCom's flagship product, the SKYWAN platform, enables international users to communicate securely, effectively and quickly over satellite.

Name: NORTHERN SKY RESEARCH
Address: One Mifflin Place, Suite 400, Cambridge, MA 02138, USA.
Tel: +1 617 674 7743
Email: info@nsr.com
Internet: www.nsr.com
Contact: Christopher Baugh
Job Title: President

Founded in 2000, NSR is a global leader in Satellite & Space Market Research and Consulting Services. NSR specializes in the analysis of growth opportunities across four core industry sectors: satellite communications, satellite & space applications, financial analysis and satellite & space infrastructure.

Name: OASIS NETWORKS
Address: HaMazmera 3, Nes Ziona, Israel.
Tel: +972 54 808 7793
Email: nkapon@oasisnetworks.net
Internet: www.oasisnetworks.net
Contact: Nimrod Kapon
Job Title: Director

Oasis Networks was established in 2004 to provide high quality field engineering, satellite systems integration and maintenance services. In this time, it has worked in over 100 countries and successfully completed more than 1,000 projects for clients across a wide range of industry sectors. Its work is carried out to the highest industry standards and is ISO 9001:2008 certified to assure clients of management quality.

Name: OMNIACCESS
Address: ParcBit Technology Park, Blaise Pascal Street s / n, W Building, 2nd floor, 07121, Palma de Mallorca, Balearic Islands, Spain.
Tel: +34 971 22 19 79
Email: sales@omniaccess.com
Internet: www.omniaccess.com

Contact: Carlos Carbajal
Job Title: Commercial Director

OmniAccess has thrived from being an innovator in marine networks and mobile VSAT communications. Its visionary managers rely on the engineering and product development team to turn a sketch on the drawing board into a great product. The scope of expertise is as wide as the depth of their knowledge. Ranging from programming code, RF engineering, satellite technology, AV system design to advanced networking skills.

Name: OMNISPACE
Address: 1775 Tysons Boulevard, 5th Floor Tysons, VA 22102, USA.
Email: info@omnispace.com
Internet: www.omnispace.com

Founded by veteran telecommunications and satellite industry executives with decades of experience, Omnispace provides a novel global hybrid communications platform. Its mission is to help connect people, businesses, and communities worldwide through new communications technologies and an innovative system that will impact billions of lives.

Name: ON CALL COMMUNICATIONS
Address: 19631 Descartes, Foothill Ranch, CA 92610, USA.
Tel: +1 949 707 4729
Fax: +1 949 588 1250
Email: sales@occsat.com
Internet: www.occsat.com

On Call Communications is a leading provider of IP based mobile satellite solutions. Since the early 1990s it has been providing video, voice, fax, and internet communications for both short term and permanent installations throughout the world. Over the years its services have evolved from sending satellite engineers out into the field to set-up and to operate large fly away systems supporting events such as phone call home services for troops during the first Gulf War to press pool communications during NATO operations in Bosnia to installing international long distance voice services to destinations throughout South America, Africa and Asia.

Name: ONLIME
Address: Bexen 2, 31855 Aerzen, Germany.
Tel: +49 5154 937 1500
Fax: +49 5154 937 1010
Email: info@onlime.com
Internet: www.onlime.com
Contact: Irina Petrov
Job Title: Vice President Marketing

Onlime is leading the way in providing high quality, secure and reliable business communications to customers across the globe. Premium quality VoIP, Internet and data connectivity are delivered over VSAT or fibre to mining, enterprise, government, military, oil & gas, banking, NGO and many other customer groups. Extensive satellite coverage and dedicated access to a growing network of fibre links with a range of the latest technology platforms allow Onlime to provide an unrivalled communications environment for business.

Name: OPTUS
Address: 1 Lyonpark Road, Macquarie Park, NSW, 2113, Australia.
Tel: +61 2 8082 7800
Fax: +61 2 8082 7100
Email: Contact Form
Internet: www.optus.com.au
Contact: Stuart Bird
Job Title: Managing Director, Wholesale and Satellite

Optus is an Australian leader in integrated telecommunications, delivering cutting-edge communications, information technology and entertainment services. In 2001 Singtel became the parent company of Optus, paving the way to become a strong and strategic telecommunications player within the Asia-Pacific region. With more than 130 years of operating experience the Singtel Group is Asia's leading communications group providing a wide spectrum of multimedia and infocomms technology (ICT) solutions, including voice, data and video services over fixed and wireless platforms.

Name: PANASONIC AVIONICS
Address: 26200 Enterprise Way, Lake Forest, CA 92630, USA.
Tel: +1 949 672 2000
Fax: +1 949 462 7100
Email: Contact Form
Internet: www.panasonic.aero
Contact: David Bruner
Job Title: Vice President Global Communications Services

For more than 35 years, Panasonic Avionics has strengthened the connection between the world's airlines and their passengers. It is recognized globally for its experience and leadership in product innovation and customization, system reliability, and customer care. It collaborates with over 300 airline customers to develop inflight entertainment and communications (IFEC) solutions that are designed to meet their unique fleet, brand, operations, and business requirements, based on state-of-the-art technology, connectivity, and industry know-how.

Name: PHASOR
Address: 1655 North Fort Myer Drive, Suite 700, Arlington, Virginia, 22209, USA.
Tel: +1 703 570 5776
Email: info@phasorsolutions.com
Internet: www.phasorsolutions.com
Contact: David Helfgott
Job Title: Chief Executive Officer

By using its unique innovations to standard microchip technologies, Phasor has radically rethought the very idea of an antenna, enabling almost any vehicle surface to receive and send satellite signals. Phasor was founded to solve the challenges of providing broadband internet services to high-speed passenger trains, with very low profile antennas. Since then, Phasor has developed its unique antenna technology to be suited to land-mobile, aeronautical and maritime satellite communication applications.

Name: PLANET COMMUNICATIONS ASIA CO., LTD.
Address: 157 Soi Ramindra 34, Ramindra Road Tarang, Bangkhen, Bangkok 10230, Thailand.
Tel: +66 2792 2400
Fax: +66 2792 2499
Email: Contact Form
Internet: www.planetcomm.com
Contact: Prapat Rathlertkarn
Job Title: President & Chief Executive Officer

PlanetComm is a leader of telecommunications and digital TV technologies in ASEAN region. It designs, makes, integrates, installs - total solution systems for enterprise, public sector, service providers, broadcasting and international clients/ markets. Its diversified technologies and products are developed from world class vendors as well as in-house R&D team. By using its proven experience and technical knowledge since 1994, it confidently makes communications work for its customer's requirements as a trusted advisor. Its professional services from pre-sales, implementation and after sales are processed through ISO 9001:2008 quality standards.

Name: **PRO BRAND INTERNATIONAL**
Address: 1900 West Oak Circle, Marietta, Ga 30062, USA.
Tel: +1 770 423 7072
Fax: +1 770 423 7075
Email: sales@pbigroup.com
Internet: www.pbigroup.com
Contact: Eric Shin
Job Title: Vice President, Sales and Marketing

ProBrand is the world leading designer and manufacturer of advanced RF (microwave) electronics and antenna systems. Founded in 1983 with its US headquarters in Marietta, Georgia, it serves some of the largest telecommunications and satellite operators in the world. Specializing in high-volume ODU & IDU terminals and CPE's, it links devices, homes, and people to the wireless and satellite signals blanketing Earth. In short, ProBrand links the world.

Name: **PROCOMSAT**
Address: Rue Olof Palme, bloc 7 16035 Hydra, Alger - Algeria.
Tel: +213 23 48 28 24
Fax: +213 23 48 28 25
Email: Contact Form
Internet: www.procomsat.com

PROCOMSAT provides hardware and support to its clients who are professionals in the industry, mainly broadcasters, telecom operators and solution integrators who use VSAT equipment, radio, microwaves, broadcast, backhauling, GSM, IPTV/SMATV ... enabling them to have quick reliable solutions and communications in the most remote geographical areas difficult to access. PROCOMSAT has resources and premises in Algeria (North and South), Libya and Europe, to facilitate storage and fast import of equipments and spare parts as well as for maintenance.

Name: **QUADSAT**
Address: Lufthavnvej 151, 5270 Odense N, Denmark.
Tel: +45 53 57 49 43
Email: info@quadsat.com
Internet: www.quadsat.com

QuadSAT is a small company located in Horsens. Its main occupation is research and development of new technologies and providing services regarding installation and maintenance of ship satellites.

Name: **RCS COMMUNICATIONS**
Address: Logali House, High Amarat, Juba, Republic of South Sudan.
Tel: +211 955 900 555
Email: info@rcs-communication.com
Internet: www.rcs-communication.com

RCS is a professional ICT (Information Communication Technologies) company for businesses and organisations looking for a service provider that understands the terrain, accepts responsibility for performance and ensures future-relevance for clients in a fast-changing world. It offers a wide range of Internet connectivity, networking, radio, energy saving and mobile satellite solutions in partnership with selected suppliers and service partners.

RCS combines in-country experience across East and Central Africa, offering international best practises and a proven track record for delivering projects in challenging environments to specification and within agreed timeframes.

Name: **RED52**
Address: Carr. Mex-Toluca #1725-F6, Col. Palo Alto, Mexico City, DF 05110, Mexico.
Tel: +52 55 5570 3973
Fax: +52 55 5570 3973
Email: ventas@red52.com
Internet: www.red52.com
Contact: Sergio Murillo

RED Five Two, S.A. de C.V. is a Mexican licensed satellite telecommunications provider, known throughout Latin America by its trade name, RED52.

The company was founded in 1999 by Sergio Murillo and Esperanza Hernandez with a clear vision to provide its customers with outstanding value added connectivity services, teleport services, occasional and full time space segments for data, voice, and video applications, as well as Internet access and tele-education content. RED52's field engineers are certified by all the major VSAT platforms, and provide training and certification to new entrants in the field.

The company serves corporate, government, and military customers through its proprietary technology and infrastructure, and operates one of the most advanced network operations centres in the region. Services include C/Ku uplink truck service, voice, video, and data links, full teleport services, including video uplink and turnaround, pre and post production, fibre optic terrestrial circuits, regulatory licensing and permitting, VSAT installations, site surveys & maintenance.

Name: **RHEA GROUP**
Address: Avenue Pasteur 23,1300 Wavre, Belgium.
Tel: +32 10 487 250
Email: info@rheagroup.com
Internet: www.rheagroup.com
Contact: Douglas Wiemer
Job Title: Director, Cyber Security Solutions

Headquartered in Wavre, Belgium, RHEA is the fastest growing Belgian space company, building its success on the passion and exceptional talent of its employees. Leveraging from its extensive knowledge base and applying an end-to-end approach, RHEA has proven successes in projects across a wide range of space missions in science, Earth observation, human space flight, meteorology, navigation and communication.

Name: **RIGNET**
Address: 15115 Park Row, Suite 300, Houston, TX 77084, USA.
Tel: +1 281 674 0100
Fax: +1 281 674 0101
Email: Contact Form
Internet: www.rig.net
Contact: Steve Pickett
Job Title: President and Chief Executive Officer

RigNet is a leading global provider of customized systems and solutions serving customers with complex data networking and operational requirements. RigNet provides solutions ranging

from fully-managed voice and data networks to more advanced applications that include video conferencing, crew welfare, asset monitoring and real-time data services. RigNet is based in Houston, Texas and has operations around the globe.

Name: ROSE COMMUNICATIONS
Address: Mercurio 31, 28224-Pozuelo, Madrid, Spain.
Tel: +34 63 00 47 100
Fax: +34 91 352 21 96
Email: jsesena@iies.es
Contact: Julian Sesena Navarro
Job Title: Consultant

Julian Sesena Navarro acts as the GVF's Spanish Correspondent. Rose has three main areas of activity: e-commerce, engineering projects on telecommunications and development of corporate webs and Internet consultancy services.

Name: RPC TELECOMMUNICATIONS
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Tel: +44 1473 487040
Fax: +44 1473 357888
Email: info@rpctelecom.com
Internet: www.rpctelecom.com
Contact: Mark C J Posen
Job Title: Managing Director and Principal Engineer

RPC Telecom was founded in August 1993 by Mark C J Posen, a former manager at British Telecom's Satellites and Lines Division. Bringing together a number of former colleagues from British Telecom, RPC Telecom aimed to capitalise on the wealth of knowledge and experience that these senior people had acquired through significant periods of employment within BT.

Name: SATADSL
Address: Chaussee de Wavre 1505, 1160 Brussels, Belgium.
Tel: +32 2 880 82 70
Email: info@satadsl.net
Internet: www.satadsl.net
Contact: Michel Dothey
Job Title: Chief Commercial Officer

SatADSL's founders combine in-depth technical knowledge about space telecommunication technologies with extensive field experience. Formed in 2010, SatADSL develops creative solutions to provide internet access in Sub-Saharan Africa. It successfully offers tailor made service plans, hardware and value added services to provide reliable, affordable high-quality IP access.

Name: SATELLITE EVOLUTION GROUP
Address: 1 Langhurstwood Road, Horsham, West Sussex, RH12 4QD, UK.
Tel: +44 1483 831 706
Fax: +44 1403 273 972
Email: richard@dsairpublications.com
Internet: www.satellite-evolution.com
Contact: Richard Hooper
Job Title: Publishing Director

The Satellite Evolution Group is a multimedia information and marketing platform for the global satellite industry. Its portfolio comprises a webportal, html newsletters, magazines, yearbooks, CD-ROMs and the only true video industry news channel. Its market-leading publications Satellite Evolution Asia, Satellite Evolution EMEA and Global Military Communications, have established themselves as the definitive voice of the industry around the globe.

Name: SATELLITE MARKETS & RESEARCH
Address: PO Box 4174, West Covina, CA 91791, USA.
Tel: +1 626 931 6395
Fax: +1 425 969 2654
Email: info@satellitemarkets.com
Internet: www.satellitemarkets.com
Contact: Virgil Labrador
Job Title: Editor-in-Chief

SatelliteMarkets.com is a free online service providing subscribers with news analysis, industry forecasts and market intelligence, covering the key trends on the global satellite communications market. This free service includes online access to the very latest insights and analysis, searchable archives, and PDF access to the Satellite Executive Briefing magazine.

Name: SATELLITE VU
Address: 153 Park Close, Walton on Thames, KT12 1EW, UK.
Tel: +44 7500 937753
Email: Contact Form
Internet: www.satellitevu.com

Satellite Vu provides high frequency earth observation information and data analytics to end users that require activity based intelligence. In short, it takes data from constellations of rapid revisit satellites that can take pictures every hour and then feeds analytics engines to count cars, planes, trucks, ships and quantify change detection etc. Satellite Vu applies artificial intelligence to this data to measure trends and exceptions to the norm that are alerted to the end user. Its aim is to be the fastest provider of such information: from user request to information delivery. Its platform is open to any source of imagery and open to add other analytics applications.

Name: SATMISSION
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Contact: Conny Hedman
Job Title: Chief Technology Officer

Satmission was established in 2004 in Kalix, Sweden, and has since grown to become one of Europe's leading designers and manufacturers of mobile satellite communication systems. Since 2010 Satmission's Gregorian carbon fibre-satellite dish with pod remains the most light-weight and (in its stowed aerodynamic pod position) the lowest structural profile driveaway antenna system in the world.

Name: SATNEWS PUBLISHERS
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Contact: Silvano Payne
Job Title: Publisher

Satnews is a provider of satellite news, publications, research and other satellite industry information in both commercial and military enterprises worldwide. Satnews is pleased to offer a range of products and services to satellite professionals, including free daily news and magazines.

GVF: Satellite...Solutions...The World

Name: SATPROF
Address: 113 S. Columbus St, Suite 311, Alexandria, VA 22314, USA.
Tel: +1 703 548 6777
Fax: +1 214 237 5131
Email: Contact Form
Internet: www.satprof.com
Contact: Ralph Brooker
Job Title: President

SatProf was founded by satellite ground system engineering industry veterans to meet the need for accessible training for satellite communications technical professionals. SatProf offers standard and custom web-based learning material and technical support for satellite installers, technicians, engineers, and managers.

Name: SATWAYS
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Internet: www.satways.com

SatWays is a telecommunications service provider focused on efficient and innovative methods to solutions delivery. With over 20 years of experience, it enables clients to increase operational efficiency so that they may better serve their end-users. By applying proven methodologies to service delivery and process reengineering, it can enhance business and operational outcomes.

Name: SEMATRON
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Tel: +44 1256 812 222
Email: sales@sematron.com
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Contact: Glenn Toal
Job Title: Marketing Manager

Sematron is a technology distributor with excellent supplier relationships with the leading players in the industry. The company can help you source satcoms and broadcast equipment and systems, RF/microwave or digital components, and diagnostic test and measurement instrumentation.

Name: SEMPER FORTIS SOLUTIONS
Address: 1602 Village Market Boulevard, Suite 210, Leesburg, VA 20175, USA.
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Email: Information@Semper-Fortis.com
Internet: www.semper-fortis.com
Contact: Chuck White
Job Title: Vice President, Chief Technology Officer

Semper Fortis Solutions™, LLC is a systems engineering and software integration company with a deep background and strong focus on information and cyber security.

Semper Fortis is a small business currently supporting the Department of Defense on a project. Semper Fortis is also a subcontractor on a $5 billion Indefinite Delivery, Indefinite Quantity (IDIQ) contract with the Army Intelligence and Security Command (INSCOM) providing information and cyber security services.

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Fax: +49 7191 971 100
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Contact: Mireia Mauri
Job Title: Marketing Manager

The company has a 40+ year history of providing network services and communications solutions globally using terrestrial satellite and wireless technologies. For this reason, its customers place implicit trust in the solutions and services it offers. Services and solutions encompass end-to-end network design and management including hosting and housing. German art of engineering and Swiss precision create a seamless customer experience across heterogeneous technologies and systems. Supported by its own geo-diverse teleports in Germany and Switzerland, secure and cost-effective connectivity is enabled via over 30 satellites and hundreds of terrestrial points-of-presence globally. Its multilingual in-house NOC guarantees around the clock assistance with unparalleled expertise.

Name: SINGTEL SATELLITE
Address: 31 Exeter Road, Com Centre, Singapore 239732.
Tel: +65 6838 3388
Fax: +65 6732 8428
Email: contact@singtel.com
Internet: www.singtel.com/satellite
Contact: Kian Soon Lim
Job Title: Head of Satellite

Singtel Satellite is Asia's leading provider of one stop satellite communications and ICT solutions, driving innovations to meet voice and digital challenges in fixed and mobile satellite segments on both land and at sea.

Singtel Satellite is a leading provider of customised satellite solutions for corporate customers in various industries, such as shipping, offshore, oil and gas. From satellite to fibre to IP, Singtel offers global coverage and versatility across platforms. Backed by three teleports pointing to more than 30 satellites and supported by its award winning IP VPN infrastructure and an extensive terrestrial network of more than 200 PoPs in over 160 global cities – Singtel ensures quality customer experience in communications and connectivity.

Name: SIS LIVE
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Contact: Donna Palumbo
Job Title: Marketing Manager

SIS LIVE is a leading provider of global critical connectivity services. SIS LIVE is the technology and team delivering content to millions of viewers worldwide via its comprehensive satellite and Anylive® fibre infrastructure.

Name: SKY PERFECT JSAT CORPORATION
Address: 8-1, Akasaka 1-chome, Minato-ku, Tokyo 107-0052, Japan.
Tel: +81 3 5571 7800
Email: Contact Form
Internet: www.sptvjsat.com
Contact: Shinji Takada
Job Title: Representative Director, President & Chief Executive Officer

SKY Perfect JSAT Corporation is the only provider of multichannel pay TV broadcasting and satellite communications

in Japan, and the largest in Asia and Oceania.

SKY Perfect JSAT maximizes the strengths available from a hybrid business, operating both a stable space & satellite business and a proven, high-growth multi-channel pay TV business under one roof, while at the same time building better services and a greater capacity to compete through efficient and agile business management policies.

Name: SKYSTREAM
Address: Internet City, Building # 14, Sheikh Zayed Road, Dubai, UAE.
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Email: info@sky-stream.com
Internet: www.sky-stream.com
Contact: Riyadh Al Adely
Job Title: Managing Director

SkyStream provides state of the art connectivity solutions for enterprises in UAE and the surrounding areas of the Middle East. When you need laser sharp connections for your mission critical operations, there is no other company as committed as SkyStream. The company offers a satellite Internet connection that is unsurpassed in reliability and performance even in the most remote areas. It makes sure that your systems and processes can proceed seamlessly while maintaining a secure and streamlined connection for your business.

Name: SKYVISION GLOBAL NETWORKS
Address: Kinetic Business Centre, Theobald St., Borehamwood, Hertfordshire WD6 4PJ, UK.
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Email: info@skyvision.net
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Contact: Eyal Maimon
Job Title: VP Broadcast & Engineering Solutions

SkyVision, established in the year 2000, is a global satellite communications service provider, offering comprehensive, integrated solutions to meet all corporate, government and Telco market requirements.

Known for its innovative approach, the company offers an extensive suite of customized services and solutions for end-to-end IP connectivity, managed from its international gateways and selected local hubs.

SkyVision's global-reaching network connects its customers to the Internet backbone with more than ten satellite platforms and a network of high-capacity fibre optic cables, via its gateways in Africa, Europe, North America and the Middle East as well as multiple points of presence (POPs) in Africa.

Name: SKYWARE TECHNOLOGIES
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Email: info@skywaretechnologies.com
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Skyware Technologies is a global leader in advanced integrated terminal solutions and satellite RF electronics, with operations on three continents and extensive expertise in the world's most in-demand satellite communications technologies. Skyware Technologies' winning combination of high technology and low-cost manufacturing makes its cutting-edge terminal solutions and RF electronics platforms unique in the market.

Name: SMI GROUP LTD
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Fax: +44 207 827 6001
Email: events@smi-online.co.uk
Internet: www.smi-online.co.uk
Contact: Miles Dixon
Job Title: Director

The SMi Group is a highly professional, independent and global event producing company that specialises in business-to-business conferences, workshops, masterclasses, training and online communities.

Name: SONEMA
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Internet: www.sonema.com
Contact: Catherine Delom
Job Title: Managing Director

Sonema is a VSAT integrator and telecommunications service provider since 1997. It owns and operates two teleports in France and provides global satellite coverage. It manages close to 600 VSAT installations in 45 countries across multiple sectors: banking, oil & gas, mining and maritime. Sonema provides fully managed communications by leveraging expertise across multiple technologies – satellite, wireless and terrestrial. Each customer it serves has their own set of distinct requirements but share the common need for reliable communications in remote and harsh environments.

Name: STAR ONE
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Fax: +55 21 2121 9321
Email: Contact Form
Internet: www.starone.com.br

Embratel Star One, a wholly-owned subsidiary from Claro, is the largest satellite company of Brazil and Latin America and operates five GEO satellites (Star One C1, C2, C3, C4, C12 and D1), and three in inclined orbit (Brasilsat B2, B3 and B4). Firstly designated as Star one, the company was created in December of 2000. Then, it was renamed to Embratel Star One in 2014. To meet new infrastructure demands in Brazil, along with the requirements of major sporting events, such as the Olympics, the company launched two new satellites: Star One C4, in July 2015 and Star One D1, in December 2016.

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Email: contact@sumerugroup.com
Internet: www.subsentio.com
Contact: Marcus Thomas
Job Title: Chief Technology Officer

Subsentio is a trusted third party service bureau that helps telecommunications carriers and Internet providers meet their law enforcement assistance obligations.

The company provides its clients with the technical solutions needed to comply with their lawful electronic surveillance requirements. Subsentio will review and validate court surveillance orders, implement the lawful surveillance, and provide similar support in response to other legal demands such as subpoenas and court orders for records held by the service provider.

Name: SUMERU MICROWAVE COMMUNICATIONS
Address: 349, Gujarat Vepari Mahamandal, (G.V.M.M.S.A.V.), Odhav, Ahmedabad - 382415 Gujarat, India.
Tel: +91 (79) 22901799
Email: contact@sumerugroup.com
Internet: www.sumerugroup.com

SUMERU is now the largest VSAT antenna supplier in India. SUMERU has a state of the art integrated facility from product design to product delivery. Its holistic design approach involving RF parameter design, mechanical structures, packing, warehousing and logistics provides cost efficiency. The highly experienced in house design team and captive manufacturing facilities for antenna, distinguishes it from others.

Name: SVEC
Address: No.12, Xinchuang Road, National High-Tech Development West Zone, Chengdu, Sichuan, China PR.
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Fax: +86 28 8783 8898
Email: oversea@svec.com.cn
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SVEC was established in 1991 and deals in satellite antenna systems - all types and specifications, and the related products such as positioners, receivers, and satellite radio.

Name: SWEDISH MICROWAVE
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Internet: www.smw.se
Contact: Thomas Lindell
Job Title: Sales & Marketing Director

Swedish Microwave (SMW) is a leading manufacturer of professional Low Noise Blockdownconverters (LNB) for the satellite market. The products are used in VSAT systems (Very Small Aperture Terminals), SNGs (Satellite News Gathering), cable-TV headends, marine VSAT, and satcom on-the-move applications.

Name: TELEFONICA INTERNATIONAL WHOLESALE SERVICES
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Tel: +34 91 482 3800
Email: Contact Form
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It is one of the world's largest telecommunications network operators by market capitalisation and number of customers. What's more, taking into account every sector of activity, it is one of the 50 largest companies in the world by market capitalisation and one of the 100 biggest in terms of revenue. Telefonica's activities are centred mainly on the fixed and mobile telephony businesses with broadband as the key tool for the development of both.

Name: TELE-POST
Address: Farip Aqqutaa 8, Postboks 1002, 3900 Nuuk, Greenland.
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Fax: +299 32 22 55
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Behind TELE-POST is the TELE Greenland A/S group, wholly owned by the Government of Greenland. TELE Greenland A/S covers a population of 56,000 scattered over thousands of kilometres, providing telecommunications, IT and postal services.

Name: TELENOR SATELLITE
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Job Title: Director of Operations

Telenor Satellite is a major European satellite provider of broadcast and data communication services for customers in the broadcast, maritime, and oil and gas markets.

Telenor Satellite owns and operates the THOR satellite fleet, positioned at 1°West, which provides high-powered and high-quality satellite capacity throughout Europe, the Middle East and North Africa.

With the successful launch of THOR 7 on April 26, 2015, Telenor Satellite has increased its presence and expanded its regional coverage to support the growth requirements of its broadcast and enterprise data customers.

Name: TELESPAZIO
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Internet: www.telespazio.com
Contact: Luigi Pasquali
Job Title: Chief Executive Officer

Telespazio, a joint venture between Leonardo (67 percent) and Thales (33 percent), is one of the world's leading players in satellite services.

The company, headquartered in Rome (Italy), employs approximately 2,500 people, relying on an international network of space centres and teleports, and operating worldwide through many subsidiaries and joint ventures.

Telespazio is a leading company in "key" sectors for public institutions, business operators and consumers, with activities ranging from the design and development of space systems to the management of launch services and in orbit satellite control; from Earth observation services, integrated communication, satellite navigation and localisation, to scientific programmes.

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Fax: +44 87 1233 9263
Email: enquiry.uk@terrapinn.com
Internet: www.terrapinn.com

Nothing beats the experience of meeting people face-to-face to gain inspiration, to learn and to do business. At Terrapinn, they curate events that stimulate the brain, spur creativity and facilitate meetings.

Name: TERRASAT COMMUNICATIONS
Address: 315 Digital Drive, Morgan Hill, CA 95037 USA.
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Internet: www.terrasatinc.com
Contact: Bob Hansen
Job Title: Vice President Global Sales & Marketing

Terrasat Communications designs and manufactures innovative RF solutions for satellite communications systems. Its ground-breaking IBUC – the Intelligent Block Upconverter – brings advanced features and performance to C-band, X-band, Ku-

band, DBS-band and Ka-band satellite earth terminals and VSAT's.

Name: TESACOM
Address: Maza 2140, Distrito Tecnológico, Ciudad Autónoma de Buenos Aires, Argentina.
Tel: +54 11 4114 2200
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Internet: www.tesacom.net

TESACOM is the leading Latin American provider of remote area integrated telecommunications solutions, and is supplier to major government organizations, the military, defence and humanitarian aid organizations, private and corporate customers in the maritime, fluvial, oil and gas, agricultural, mining, energy, tourist, and transportation markets among others.

With offices in Argentina, Brazil, Chile, Paraguay, Panama, Peru, Uruguay and Venezuela, TESACOM provides a wide range of integrated communications solutions, including satellite voice, data and text messaging services. The company also provides a full portfolio of added value applications, including network integration, asset tracking and control, ship and vehicle location, and bespoke M2M integration for all the above market sectors.

Name: THAICOM
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Email: contact@thaicom.net
Internet: www.thaicom.net, www.ipstar.com
Contact: Patompob Suwansiri
Job Title: Chief Commercial Officer

The company became a listed company on the Stock Exchange of Thailand on 18 January 1994, and is officially traded under the symbol THCOM. Since its establishment, the company has expanded its business activities to include Internet and telephone services, and DTV satellite television dish sales. As of 31 December 2012, INTOUCH, which is the Company's major shareholder, holds 41.14 percent of the company's shares. Thaicom has launched eight satellites, Thaicoms 1, 2 and 3 (all de-orbited), Thaicom 4, (IPSTAR), Thaicom 5, 6, 7 and Thaicom 8 which was successfully launched at the end of May 2016. The company has also built high-quality satellite service facilities besides its main earth control station.

Name: THINKOM
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Email: gregory.otto@thinkom.com
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Contact: Greg Otto
Job Title: Director - Sales & Marketing

ThinKom, established in 2000, is focused on enabling its customers to provide global connectivity through innovative and cutting edge antennas. Its current antenna offerings operate in the X, K, Ka and Q frequency bands and it continues to expand a library of antenna offerings. The company's patented VICTS and CTS technologies are incorporated in extremely low profile antennas, ideally suited for commercial aircraft, military vehicles and other applications in which low drag and/or low probability of detection are key advantages. In addition to being low profile, the efficiency of apertures result in operating significantly below what is possible with other low profile antennas offered in the marketplace.

Photo courtesy of Shutterstock

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Contact: Reem Sadek
Job Title: Communications Manager

Thuraya Telecommunications Company is an industry leading MSS operator and a global telecommunication provider offering innovative communications solutions to a variety of sectors including energy, broadcast media, maritime, military and humanitarian NGO.

Name: TSAT
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Contact: Christian Bergan
Job Title: VP, Sales & Marketing

TSAT's satellite communications solutions enable management of mission critical infrastructure in harsh and hard to reach remote locations. Private networking, ruggedized hardware and low operational cost makes TSAT the preferred solution, even for small networks. For more than two decades, TSAT customers across the globe have relied on their TSAT networks to provide maximum uptime and peace of mind.

Name: TS GLOBAL NETWORK SDN BHD
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Tel: +60 3 8320 0080
Fax: +60 3 8320 0089
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Internet: www.tsgn.com.my
Contact: Kent Ho
Job Title: Chief Executive Officer

TS Global Network Sdn Bhd [tsgn] is a privately owned company with a steadily growing international presence, that's meeting the challenges and responding to the increasingly demanding needs of global customers. It delivers integrated communications into complex hybrid networks involving optical fibre, microwave, wireless and mobile technologies. This has made it the region's sought-after experts in adapting applications over satellite.

Name: TURKSAT
Address: Konya Yolu 40. Km, Golbasi/Ankara, Turkey.
Tel: +90 312 615 3000
Email: info@turksat.com.tr
Internet: www.turksat.com.tr
Contact: Abdulkadir Sener
Job Title: Deputy General Manager

Türksat Company is one of the world's leading companies providing satellite communications through the satellites of

Türksat as well as the other fleets. Providing services for voice, data, internet, TV, and radio broadcasting through the satellites across a wide area extending from Europe to Asia, Türksat is able to provide flexible solutions aimed at customers' needs in regions where no terrestrial infrastructure is available.

Name: **TUYAD**
Address: Halil Rifat Pasa Mah.Perpa Ticaret Merkezi B Blok Kat:12, No:2125 PK:34384 Okmeydaný, Istanbul, Turkey.
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Email: bilgi@tuyad.org
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TUYAD is a non-profit, non-governmental organization which was founded by companies in the satellite sector. It was set-up in Istanbul in 2001 by the most respected satellite operator, DTH pay TV platforms, STB manufacturers, SMATV equipment manufacturers and integrator companies of Turkey for the purpose of increasing the quality of the industry.

Name: **ULTISAT**
Address: 708 Quince Orchard Rd, Suite 120, Gaithersburg, MD 20878, USA.
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Internet: www.ultisat.com
Contact: Moe Abutaleb
Job Title: President and Chief Executive Officer

For over 25 years, UltiSat has been a recognized leader in providing secure, reliable satellite communications networks that are flexible and scalable to constantly changing environments. Headquartered in Gaithersburg, Maryland, USA, it has over 70 employees, a teleport in Blaavand, Denmark, sales offices in the United States and Europe, a global field-service operation, and technology partners around the globe.

Leveraging its managed networks expertise, ground-segment infrastructure, and VSAT capabilities, UltiSat provides broadband networking, enterprise data, digital telephony and video-on-demand services anywhere in the world to military and government entities, telcos, service providers, IGOs, and enterprises.

With networks in more than 135 countries, UltiSat is one of the few companies that currently operates global monitoring networks that comprise sites on every continent.

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Email: mp@ultra-dev.net
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Contact: Michael P. MacDonald
Job Title: Consultant

Ultra comprises a group of expatriates and local consultants in various countries with a unique track record of establishing and managing business both in their own territories but also across the Asian-Pacific region. Ultra has specific experience and partner presence in Singapore, Australia, China, Hong Kong, Myanmar, Vietnam, Thailand, Indonesia, Laos, South Africa and Tanzania.

Name: **ULTRA ELECTRONICS, GIGASAT**
Address: Tring Business Centre, Icknield Way, Tring, HP23 4JX, UK.
Tel: +44 1442 892000
Email: enquiries@ultra-gigasat.com
Internet: www.ultra-gigasat.com

Ultra Electronics, GigaSat is an industry leader for mobile and flyaway satellite earth stations with a focus on wireless broadband communications as the core technology. Formerly the Giga-Group, the company was formed in 2001 and acquired by Ultra Electronics in 2012.

GigaSat is part of a >$1 billion company comprising 27 businesses in diverse product areas.

Name: **UNISAT**
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The UNISAT is a company dedicated to providing specialized technical services consulting and professional training in telecommunications, TV, and Internet networks, with vast historical performances with organizations from the public and private sectors in Brazil and abroad.

Founded in 1989 by an experienced group of professionals from NEC Brazil, Embratel and Telebahia, UNISAT's training covers a wide range of service lines, including business process modeling, development of executive plans and business plans, regulatory support, licensing support, market research, product development, systems design, project management and implementation.

UNISAT is also the representative, for Brazil and Portuguese-speaking countries, of the Global VSAT Forum - GVF, an entity that acts internationally for the promotion, dissemination and acculturation in the use of satellite digital communications technologies and services.

Name: **VIKING SATCOM**
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Tel: +1 517 629 3000
Fax: +1 517 629 2379
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Internet: www.vikingsatcom.com
Contact: Ken Sexton
Job Title: Sales and Marketing Manager

Viking Satcom is at the forefront of innovation and technology and a leader in the commercial satellite antenna industry. It offers a wide selection of satellite communication products ranging from antennas to their related RF components. The Viking team has years of experience both in the industry and in the field to bring you the highest level of product knowledge and customer service available.

Name: **VSAT SERVICES ASSOCIATION OF INDIA**
Address: 103 Ashoka Estate, 24 Barakhamba Road, New Delhi, India 110 001.
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VSAT Services Association of India (VSAI) is the independent, non-partisan and non-profit organisation representing the VSAT industry in India, which includes VSAT network operators, VSAT manufacturers, satellite operators and organisations associated with the telecom industry. VSAI is also a founder member of the Global VSAT Forum.

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TERRASAT Communications, Inc.

Leading edge wireless broadband communications solution provider

Advantech Wireless supports the critical need for High Throughput Satellite (HTS) communications in a rapidly expanding digital environment.

The company's proven, low-cost, and highly reliable system solutions are meeting the ever-increasing need for high-bandwidth communications essential to military and government solutions, as well as cellular network providers, broadcasters, robust corporate networks, and security. It integrates award-winning research and development engineering into its designs.

As a global company, Advantech Wireless is committed to creating best-in-class technologies to meet and exceed its customers' needs.

For both commercial and military needs, the company is uniquely positioned to satisfy the most demanding requirements on land, sea and air. Advantech Wireless is delivering real-world solutions today with successful projects implemented in more than 150 countries in LATAM, Europe, Asia, Oceania, Africa and North America and offices around the world.

VSAT SOLUTIONS

Adaptive Satellite Access Technology 2nd Generation – A-SAT-II™

Efficient bandwidth utilization is key for the success of any satellite system and is a critical capability in a High Throughput Satellite Network. Well ahead of any solution available in the market, Advantech Wireless has developed a revolutionary technology for use on the Discovery VSAT Discovery Hubs product line-up based on Adaptive Satellite Access Technology Second Generation (A-SAT-II™).

Maximizing satellite bandwidth efficiency

The Award Winning A-SAT-II™ technology is even more efficient than the industry leading A-SAT™ technology which, monitors channel utilization and dynamically switches the satellite access method and MODCOD seamlessly for the return channel.

A-SAT-II™ combines three different waveforms to optimize the spectral efficiency (Bits/symbol/Hz) based on the traffic or application being transmitted in the network. The traffic is constantly monitored and switched dynamically to the optimal access scheme and thereby minimizes the satellite bandwidth costs.

Advantech Wireless has developed a new line of VSAT Discovery™ Hubs based on A-SAT-II™. The complete line of DVB-RCS Hubs range from the Entry Level Discovery 100 through the Discovery 200 and Discovery 300, to the New Millennium Series High Capacity VSAT Hub and terminals for HTS. This powerful suite of products provides a solution well matched to a broad range of user applications and requirements.

Millennium Series VSAT Hub for HTS

The Advantech Wireless Millennium high capacity VSAT hub is purposefully developed to meet the needs of large VSAT networks typically operating on High Throughput Satellites (HTS). The Millennium modular design is easily expanded as network size increases.

With Advantech Wireless'modular design, a custom configuration can be designed to maximize rack space utilization and minimize the amount of equipment required to support network requirements.

Each forward link block includes the Advantech Wireless FLS-1000 DVB-S2 modulator with an IP encapsulator followed by the ACM merger/slicer allowing transmission of different MODCODs simultaneously. The ACM merger/slicer function provides feedback to the QOS-1000 device for traffic shaping and priority classification. The PEP-1000 performs TCP and HTTP acceleration, payload and header compression, including RTP compression as well as HTTP pre-fetching and caching.

Each return link block consists multiple multicarrier demodulators (MCD) and several processors. Each MCD can support up to 96 carriers with an aggregate throughput of 48 Mbps. Return carrier burst rates range from 128 kbps to 12 Mbps each. The processors schedule all traffic bursts dynamically almost 40 times per second, for the fastest satellite bandwidth scheduling refresh rate and the lowest jitter in the industry. The processors are also responsible for scheduling the SCPC-DAMA FDMA carriers when A-SAT-II™ is included the hub.

Applications

The Advantech Wireless Millennium high capacity VSAT hub has been developed to enable service providers targeting to support large broadband interactive HTS satellite networks.

Driven by the continual consumer demand for higher throughputs, the Advantech Wireless Millennium high capacity VSAT hub provides the service provider with an easily expanded platform to support over 100,000 consumer terminals in today's HTS satellite networks.

Ka-band HTS network configurations

Advantech Wireless family of 8000 Series VSAT terminals are the most powerful economical terminals available for HTS GEO constellations as well as traditional satellite systems.

These terminals are able to transmit in MF-TDMA, BM-FDMA, or DVB-S2/S2X mode and receive DVB-S2/S2X waveforms. The 8000 Series terminal design is an evolution of the previous generation of terminals including the significant increase in the transponder bandwidths supported for the forward link and the integration of the modem, BUC and LNB functionality into one outdoor unit.

The complete outdoor terminal including its size and weight reduction is a game changer. The terminal requires a single Ethernet connection to the indoor equipment easing installation. Supporting MF-TDMA, BM-FDMA, and DVB-S2/S2X adds greater transmit waveform flexibility, affording the end-user greater trade-off flexibility. The software-defined modem adds the ability to switch from burst MF-TDMA to continuous carrier DVB-S2/S2X transmission. This multi-waveform capability provides the user with flexibility to transition between the bandwidth-assignment flexibility of DVB-RCS/RCS2 and the unrivalled physical performance of DVB-S2/S2X transmissions.

The terminal has been designed with all key IP features to fulfill the needs of a consumer, enterprise or government user. The 8000 Series terminals offer powerful connectivity directly to the LAN/WAN environment or directly to a host computer. A truly universal solution, it is an out-of-the-box, ready-to-go, cost-effective broadband solution for HTS applications where cost, performance and waveform flexibility provides significant operational advantages.

Second Generation SapphireBlu™ Class of UltraLinear™ GaN based SSPAs

Advantech Wireless is the only company capable of offering a unique solution for services like DTH Broadcasting, High Data Rate Telecom Services and Deep Space Communication with impressive savings in energy costs, satellite bandwidth, CAPEX and OPEX.

The Second Generation SapphireBlu™ Class of UltraLinear™ GaN based SSPAs and BUCs from Advantech Wireless are the ideal choice for high power, wide frequency band uplinks. One single GaN based SSPA offers higher performance in multi carrier mode than several linearized TWTs and Klystrons. The new systems can saturate all transponders of an entire satellite and obtain maximum bandwidth/power efficiency.

Based on its analysis of the gallium nitride (GaN)-based devices market, Frost & Sullivan recognized Advantech Wireless with the 2014 North American Frost & Sullivan Award for New Product Innovation Leadership. Advantech Wireless was awarded Teleport Technology of the year 2014 by the World Teleport Association and Most Innovative Product of the Year.

Advantech Wireless

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Continuing to innovate

AnaCom, Inc has designed and manufactured satellite communications equipment for over 30 years. After shipping its first product in 1995, a 5W EC-band transceiver, AnaCom soon followed with its Ku-band line and has since developed product families of BUCs and SSPAs, as well as a variety of related accessories including the ubiquitous 1+1 Redundancy Protection Switch System.

AnaCom continues to innovate with new technologies, while never losing track of its founders' guiding principle: "Quality is Job #1," ensuring its position as industry leader in reliability and performance.

Anacom's future products include a redesign of classic product lines, bringing them well up-to-date with technological advances, including the upcoming adoption of GaN technology for smaller-sized units with better power consumption, good for your bottom line as well as the environment.

AnaCom's latest RF/microwave products include several lines of BUCs in ranges of power and size including a new 13GHz Ku-Band BUCs, as well as their indoor Rack-Mounted Converters. AnaCom's other popular product lines include AnaSat Transceivers, ELSAT BUCs, SSPAs, LNAs and other accessories covering C, Ku and X-band frequencies in power levels from 4 to 400 Watts.

All of AnaCom's products now feature Ethernet support as well as a RS202/485 serial interface. In conjunction with Ethernet support, AnaCom equipment now supports HTTP with a built-in web interface, so you can monitor and control your units via any web browser from your own computer. You can also connect via telnet or on an SNMP network, allowing you to monitor your AnaCom unit over your existing Network Management System.

AnaCom's Supervisor 10 Monitor and Control software offers a common interface for all AnaCom outdoor products. You can monitor all of your AnaCom ODUs from a single window, and control one or all of them with a single button click. Supervisor 10 puts you in control of your AnaCom units, from a single ELSAT BUC, to an entire network of ODUs, each protected with AnaCom's 1+1 or 1+2 Protection Switch redundancy systems.

As people are the key to any successful business, AnaCom, Inc. has worked hard to acquire good people and create an environment that keeps them challenged and excited. As a result, the average time worked at AnaCom by their employees exceeds 10 years. With such employment longevity, AnaCom employees know the products better, know their customers better, and have vast troubleshooting experience, resulting in immeasurable benefits to AnaCom's customers.

Manufacturing

Manufacturing facilities are located in a technology campus in San Jose, California, In the center of the Silicon Valley. AnaCom uses automatic pick and place assembly on their printed circuit boards, casting and CNC machining for their housings. Final test and calibration are done automatically via computer. Statistical Process Controls is applied to ensure good products with uniformity of quality across all product lines.

AnaCom has service centers in the USA, the UK (serving the EU), Africa, Russia, China, India, and Thailand. If it's broke, they can fix it - just about anywhere in the world.

AnaCom, Inc. also has sales personnel, distributors and representatives covering the globe. Wherever you are located, they can respond rapidly to your needs and requests. If you have a rush order, they can get you the equipment you need on time and on budget.

Since bringing out its first C-band units over 30 years ago, AnaCom, Inc. has always been at the cutting edge of RF design. The company's technical staff go the extra mile to fully understand the impact of design updates and industry trends, both good and not-so-good. AnaCom does not blindly follow the industry, but instead relies on its own research to develop a product strategy that best serves customer needs.

AnaCom today has a huge installed base of equipment covering the entire world. Whether it is a mountaintop in the Himalayas, an oil platform in the Gulf, or a wildfire in your state, behind the scenes - AnaCom is at work. Whether it is consumer, business, military or government applications, behind the scenes – AnaCom is at work.

ANACOM, INC.

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Arabsat-4, courtesy EADS Astrium.

Serving the growing needs of the Arab world

Founded in 1976 by the 21 member-states of the Arab League, Arabsat has been serving the growing needs of the Arab world for over 40 years, operating from its headquarters in Riyadh-KSA and two satellite control stations in Riyadh and Tunis.

Now one of the world's top satellite operators and by far the leading satellite services provider in the Arab world, it carries over 500 TV channels, 200 radio stations, pay-TV networks and a wide variety of HD channels reaching tens of millions of homes in more than 80 countries across the Middle East, Africa and Europe—including an audience of over 170 million viewers in the Middle East and North Africa (MENA) region alone tuned into Arabsat's video "hotspot" at 26° E.

Arabsat owns and operates six satellites, at three orbital positions, 20°, 26°, 30.5° East: Arabsat-5C (20°E), BADR-4, BADR-5, BADR-6 and BADR-7 (26°E), Arabsat-5A (30.5°E).

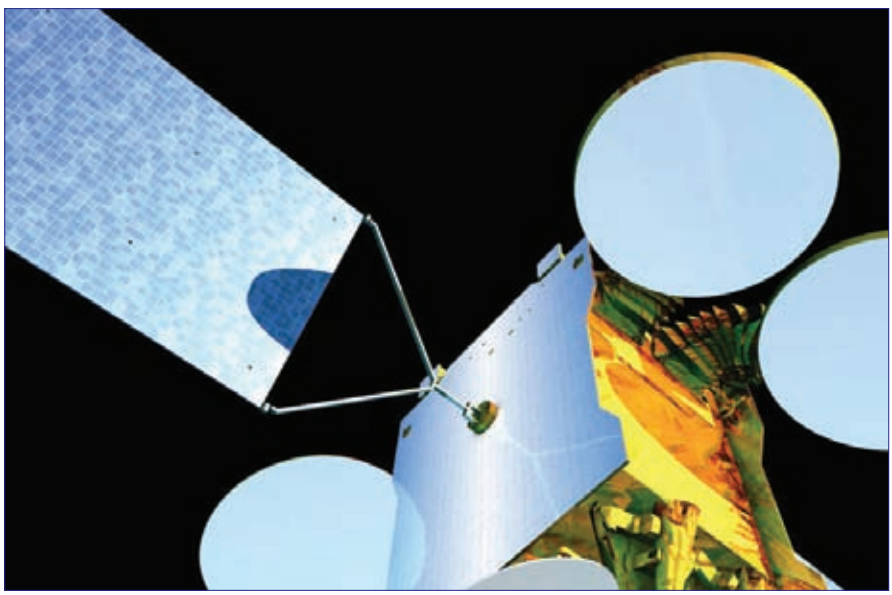
Youngest regional fleet

These state-of-the-art satellites, now the youngest regional fleet over the MENA area, make Arabsat the only satellite operator based in the region offering the full spectrum of broadcast and telecommunications services.

These latest technology birds are equipped to provide, not only the highest downlink power over the widest coverage area than any other satellite fleet around, but also services in the most recent bands including Ka-band for innovative interactive services, in addition to enabling an extraordinary complete access to European markets, all through either one single Pan- Arab+Europe extended beam, a purely MENA beam, or highly sophisticatedly designed market-specific spot beams (North W.Africa, W.Africa, S.Africa, East MENA and C.Asia).

Arabsat offers the most secure, reliable, and versatile fleet with 'hot' in-orbit back-up and guaranteed long-term expansion space capacity.

Arabsat also maintains strategic partnerships with most of the world's leading satellite companies and VAS integrators and with the acquisition of Hellas Sat, one of the leading telecom groups in southeastern Europe, these partnerships and acquisitions continue to expand Arabsat's reach with new orbital slots and frequency rights, allowing customers to reach farther than ever and deliver content and state-of-the-art solutions to any end-viewers audience or business partner around the world.



Arabsat-5A, courtesy EADS Astrium.

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CPI's 160W Ka-band GaN BUC provides up to 100W of linear power at the flange

CPI: solid state VSAT solutions

Communications & Power Industries LLC (CPI), a US based company, has a long history of providing solutions for radio frequency, power control, instrumentation, defense communications, medical, scientific, and maritime, commercial, & military VSAT system needs. Over its 68 year history, the company has grown to be a global leader in medium and high power communications products including TWTAs and solid state power amplifiers.

CPI has continued to build upon its solid state product line, acquired from Codan five years ago. From this acquisition, CPI has gained more than fifty years of additional experience in high frequency technology. CPI's VSAT-related engineering capabilities are based in Palo Alto, CA (USA), Boalsburg, PA (USA), Adelaide, SA (Australia), and Georgetown, Ontario (Canada), reflecting the company's strong commitment to research and development. The product lines are manufactured at CPI's manufacturing facility in Georgetown.

Solutions for VSAT applications

A critical element of the transmit side is the block up-converter and amplifier (commonly referred to as the BUC, BUC/SSPA or SSPB). CPI's satcom products line provides a host of BUC solutions in C, X, Ku and Ka-bands. These solutions cover RF output power ranges from 8 watts up to 200 watts, and include GaN technology allowing for more efficient and more compact designs.

Typically, VSAT systems require output powers from as low as 1 watt to upwards of 50 watts. Therefore, CPI Satcom offers an attractive set of BUCs for higher-end VSAT terminals. For military systems, CPI has experience with X, Ku- and Ka-band products included in DISA and ARSTRAT/WGS certified terminals. This familiarity has proven valuable to our customer base in regards to the necessary performance required to provide smooth integration of our product into the terminals.

For both commercial and military applications, CPI has recently begun to develop a line of GaN-based solid state transceivers, including compact designs light enough for man-pack applications, and high power products suitable for troposcatter communications.

In addition to the more standard BUC offerings, CPI's solid state portfolio offers customized modules for certain specific applications as well as low noise amplifiers and even an LNB series at X-Band. This flexibility allows CPI to engage in many opportunities where other providers may have limitations.

40 dBm X-band GaN Transceiver *courtesy of CPI*

GaN-based Solid State BUC

Customer service and support

CPI Satcom Product's culture of service and support is widely known among its loyal customer base. Although CPI's robust designs, low lifetime cost of ownership, outstanding reliability and quick delivery are elements that play important roles in the selection of products for VSAT applications, customers also appreciate CPI for the company's responsiveness and commitment. With a staff of seasoned application engineers, a network of global repair and service centers, and 24/7/365 support, it is clear that the selection of CPI is the start of a valued partnership rather than a 'won'-and-done deal.

Final word

CPI provides a wide range of established RF BUC, amplifier and transceiver solutions for commercial, military, airborne and maritime communication network needs. Known for its technical innovation, reliable product offerings and unparalleled support, the company is one of the truly outstanding choices one can make for VSAT related products.

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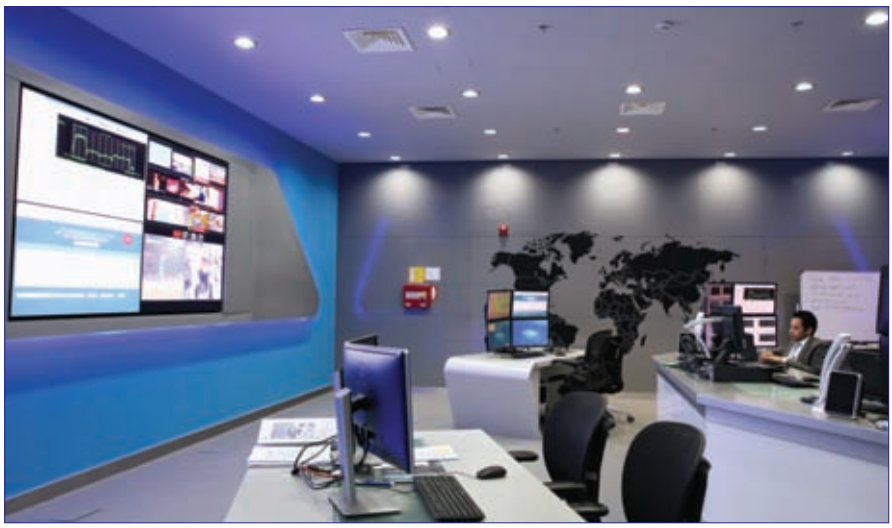


Capacity Management Centre

World-class operator

Es'hailSat, the Qatar Satellite Company, is a communications satellite operator headquartered in Doha, Qatar. Es'hailSat was established in 2010 as an independent company with the goal to manage and develop Qatar's presence in space. The company provides independent, high-quality, advanced satellite services to broadcasters, businesses and governments in the MENA region and beyond.

Vision

Es'hailSat aims to be a world class operator who effectively contributes to the success of Qatar's National Vision 2030 by adding a new dimension to the diversifying economy.

Mission

Es'hailSat will provide advanced satellite services to strategic stakeholders and commercial customers, who value broadcasting and communications independence, quality of service and wide geographical coverage.

With a goal to be a truly global satellite operator and service provider, Es'hailSat started operations of its first satellite Es'hail-1 at 25.5° E in 2013 supporting key broadcasters in the region, beIN SPORTS and Al Jazeera Media Network. Es'hail-2, the company's second satellite is expected to be launched in 2018 and will be co-located with Es'hail-1 at the MENA broadcast hotspot of 25.5° E / 26° E orbital location.

Es'hail-1 is successfully supporting the strong demand for broadcasting services, telecommunications and critical data distribution in the region. Having started service on Qatar National Day, 18th December 2013, with Al Jazeera Media Network and beIN SPORTS, it has gone from strength to strength with coverage of the Rio Olympics 2016, UEFA Euro 2016, FIFA World Cup 2014 and the launch of new niche Arabic channels over the last few years.

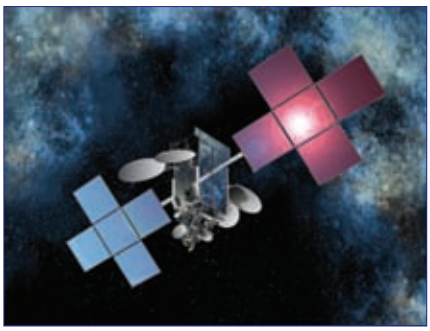
Having both Ku-band and Ka-band capacity at the 25.5° E and 26° E hotspot position enables Es'hailSat to provide the region with the most advanced and sophisticated services in broadcast, telecommunications and broadband.

Es'hailSat's expansion plan is set to continue with new satellites in prime hotspot locations, offering customers the most flexible and reliable service. Es'hailSat also adopts the concept of "world-wide footprints" through partnerships with leading regional and international satellite operators around the globe.

Es'hailSat aims to bring a new dimension to Qatar's diversifying economy by building a world-class company and a centre of excellence in the region. As well as developing a satellite system in space, the company is also investing in local infrastructure and talent, ensuring that it nurtures and grows satellite technology for Qatar, key to providing a secure, independent communications network to meet the needs of stakeholders, customers now and in the future.

Es'hail-2

Es'hailSat is on its way to delivering on its plan to provide additional premium satellite capacity in the MENA region with the expansion of the Es'hailSat fleet. The manufacturing of Es'hail-2 is on schedule and it is scheduled for launch in 2018, which will further boost broadcasting and global connectivity for Qatar and the entire Middle East and North African region. Es'hail-2 is a high-powered, advanced satellite with both Ku-band and Ka-band capabilities to provide TV distribution, telecoms and government services. The satellite footprint covers the Middle East and North Africa and will be positioned at the 26°E hotspot location.



Es'hail-1

New teleport for MENA

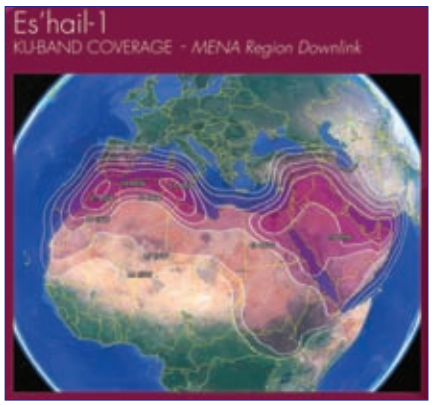
The new Es'hailSat Teleport is a state-of-the-art facility providing satellite Telemetry, Tracking and Command (TT&C) facilities and capacity management, together with a wide range of teleport services such as uplink, downlink, contribution, multiplexing, encoding, playout and broadcasting, tailored for Es'hailSat's stakeholders, customers and business partners. The high-tech teleport will have back-up studios for TV channels and serve as a disaster recovery facility for broadcasters. The site is connected to key media broadcasters in Qatar and the region, and to the international fibre gateway by means of a redundant, dedicated and diverse fibre optic link. The teleport is a custom built facility for Es'hailSat fleet of satellites and is fully owned, operated and controlled by Es'hailSat.

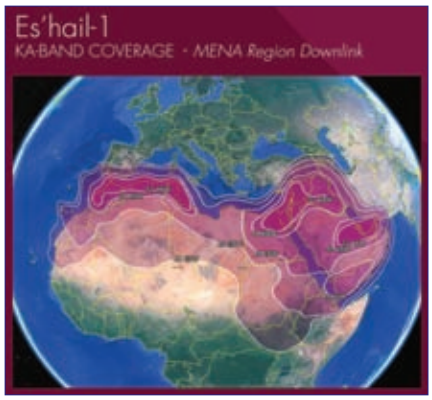
Solving challenges of interference for MENA broadcasters

As secure transmissions continue to be of paramount importance in the MENA region, Es'hailSat is working with various parties to reduce and eliminate satellite interference and provide a secure transmission network for its customers. With Qatar hosting the 2022 FIFA World Cup, Es'hailSat is encouraging its customers to use Carrier ID as part of its cooperation within satellite community for interference reduction and identification. Es'hailSat satellites have been designed and built with state of the art anti-jamming capabilities that help it avoid any intentional or unintentional interference. This feature is critical for customers using the satellites for mission critical work and for broadcasters who greatly value uninterrupted signals reaching their customers. In addition, Es'hailSat has a geo-location system installed in its teleport to accurately identify origins of any interference and take appropriate action with or against the interfering party.

Es'hail-2

Satellite Operator of the Year Award





Products/Services

Premium content on Es'hail-1

Es'hail-1 continues to go from strength to strength, demonstrating the value of Es'hailSat's offering in terms of technical capabilities and performance, and also in terms of independence and security of content we broadcast. In addition to providing transmission for established news, sports and entertainment channels, a growing number of new channels from around the region are choosing Es'hailSat to broadcast their channels in the MENA region. With steady subscriber growth since starting transmission on Es'hail-1, beIN Sports continues to roll out new HD and SD channels via Es'hailSat satellites, seeking to diversify and expand its audience with new content including movies, entertainment and sports. In addition, with Al Jazeera's bouquet of HD channels on Es'hail-1, 25.5°E / 26° E is truly a hotspot for quality high definition channels.

Broadcast services

Operating from the MENA orbital hotspot of 25.5° E / 26° E, covering key consumer markets in GCC and North Africa, Es'hailSat's high powered satellites provide the key infrastructure to media networks and broadcasters to distribute TV channels directly to consumers via small satellite dish. Customers are able to leverage on Es'hailSat's satellites and teleport infrastructures to provide services such as linear TV, video on demand, high definition TV and 4K TV among others. Es'hailSat's highly efficient and cost effective solutions for Digital News Gathering (DSNG), playout, content transfer, uplink, occasional use services, etc. can be tailored to specific customer requirements.

Telecommunication services

Es'hailSat's collaboration with Ooredoo allows both companies to work together on a range of new satellite and world-class communications services for Qatar and the region. Partnership with Ooredoo helps drive home grown innovation and stimulate the development of a full portfolio of solutions to support VSAT, voice, data and broadband business via satellite.

Growing demand for Ka-band

Demand for Ka-band services across the MENA region, especially in hub based solutions and mobility services, is growing and Es'hailSat's Ka-band hub located in Doha provides flexibility to service providers allowing them to choose a style of engagement and commitment to suit their business needs. Through the hub's high-tech infrastructure, Managed Service Providers (MSPs) can provide telecom solutions that support a range of satellite-based data communications applications, ensuring their customers benefit from flexible and efficient technologies providing higher compression with lower latency, WAN optimization and bandwidth optimization for OPEX savings. The main services provided by Es'hailSat's hub are Internet Services, VoIP Services and Corporate Network Connectivity.

Teleport lobby

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Headquarters. Photo courtesy of Hughes

Innovative services and solutions

Hughes Network Systems, LLC (HUGHES), with 2,500 employees around the world, is driven by the promise of connectivity. As the undisputed global market leader in satellite technology and services, Hughes is powering a connected future, from bridging the digital divide to managing the networks that shape economies and enhance resilience of communications when disasters strike.

Headquartered in Germantown, Maryland, and a subsidiary of EchoStar Corporation, Hughes delivers broadband satellite systems and fully managed network solutions to enterprises and governments in over 100 countries. Its flagship high-speed satellite Internet service is HughesNet®, the world's largest satellite network with over one million residential and business customers across the Americas. With service businesses in the US, Europe, India and Brazil, and worldwide sales/support offices, Hughes brings its innovations to connect people and organizations no matter where, meeting the surging demand for reliable and affordable Internet access across the globe—and what sets the company apart.

A technology and industry leader

Since inventing the commercial VSAT network over three decades ago, today Hughes continues its leadership as the #1 global provider with 50 percent of market share (*Ref COMSYS 2017 VSAT Report, 14th Edition), having shipped six million terminals to customers in more than 100 countries. The JUPITER™ System is the world's most widely deployed High-Throughput Satellite (HTS) platform, operating on more than 20 satellites by leading service providers, delivering a wide range of broadband enterprise, mobility and cellular backhaul applications.

Latest HTS, EchoStar XIX

The latest high-throughput satellite (HTS) from Hughes, EchoStar XIX/JUPITER 2, launched in late 2016 joins EchoStar XVII/JUPITER 1 and SPACEWAY® 3 in geo-stationary orbit, powering broadband satellite services with coast-to-coast coverage across the continental US, as well as parts of Mexico and Canada. The world's highest capacity broadband satellite, it employs a multi-spot beam, Ka-band architecture, and delivers more than 200Gbps of capacity, bringing customers higher speeds, more data and a wealth of value-added features.

Innovative services and solutions

In the US alone, it is estimated that more than 14 million households are either unserved or underserved by high speed terrestrial Internet services. Hughes is helping close this 'digital divide' through its market-leading HughesNet® service—with over one million subscribers, and ranked #1 by FCC in delivering on advertised speeds among all ISPs – connecting homes, offices and communities no matter the location and with a range of affordable plans. Launched in 2017, HughesNet Gen5 leads in multiple categories, including consistency of speed, latency, and website performance.

Building on its success in North America, HughesNet service was expanded internationally in 2016 to Brazil, reaching a majority of the population in South America's largest country. And last year it was introduced in Colombia, making it the largest coverage footprint of satellite Internet service in the Americas. Hughes will continue to assess such 'digital divide' opportunities globally, where lack of affordable broadband internet access is acute.

Serving governments and enterprise

For governments and enterprises large and small, Hughes brings comprehensive managed network services under its HughesON® brand, with to date more than 250,000 locations globally. Employing the most cost-effective mix of fixed, wireless and satellite technologies, HughesON integrated network solutions span a wide range of applications including VoIP, digital signage, online training and more. The award-winning Hughes Managed SD-WAN solution combines world-class security and ActiveTechnologies® capabilities to deliver more capacity and improved application performance, yielding high availability and cost-effectiveness of multi-site networks by leveraging low-cost broadband circuits.

Hughes is also a preferred partner for satellite on-the-move solutions—on land, sea and in the air. Working with industry leaders Global Eagle, SES and Thales, Hughes airborne solutions now power broadband connectivity for nearly 1,000 commercial aircraft in service around the world. Designed to operate with both spot and wide beam satellites in Ka- and Ku-bands, Hughes latest airborne solution has been designed from the ground up to deliver a level of performance and reliability that will serve the connectivity needs of the airlines and their passengers well into the next decade.

For cellular mobile operators, Hughes satellite-based backhaul solutions have been specifically designed to enable rapid and cost-effective service expansion into rural or hard-to-serve markets, optimizing space segment resource utilization through advanced traffic management algorithms.

Hughes technology and services are sought out for high stakes needs around the globe, including military applications and emergency services. After 2017's Hurricane Maria eviscerated 2,400 miles of transmission lines in Puerto Rico and the US Virgin Islands— which left more than three million residents, businesses, hospitals, schools and other institutions without power and communications — Hughes delivered rapid connectivity solutions to emergency responders, recovery centers, hospitals, pharmacies, retailers, and more. In the storm's aftermath, the 1,500+ active sites where Hughes VSATs were deployed helped play a key role in re-establishing the island's economy and food and supply network.

Powering a connected future

Hughes is constantly driven to innovate, build more flexible technologies, and create better solutions in the communities where its customers live and work. Across four continents, Hughes is doubling up on its efforts to bring the digital world to the unconnected. Its investments in future technologies like complimentary LEO and GEO satellite systems, will enable Hughes to reach new communities, deliver ever better services, and help businesses to leverage the latest networking technologies and applications to stay ahead and succeed.

That is the Hughes mission: To define what's next and deliver on the promise of global connectivity.

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GVF serves as the unified voice of the international satellite industry. Whether your organisation is a satellite service or system provider, a regulator or ministry, or an end user, we would be honoured to facilitate your participation in this dynamic industry.

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This agreement represents a contract between the Members of the Global VSAT Forum (hereafter the GVF). The GVF is a non-profit, independent entity registered as a company limited by guarantee in the United Kingdom whose primary business is the representation and promotion of the global Satellite Communications Industry. GVF invites organisations involved in the provision of satellite systems or services to sign up for membership. Please fill out the form below and return it via email to:

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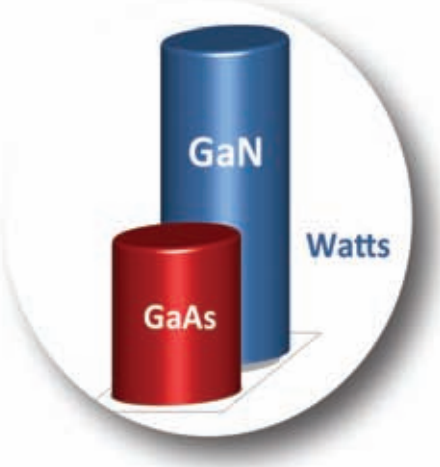

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